

Traceability of SMARTS Requirements from Document: various for Project: Constellation (CxP)										
Filter Settings: Tech Authority: Any   OSMA Opinion: S   CxP Implementation: S										
Parent Doc Num	Parent Doc Para	Parent Req ID	Parent Req Text	Tech Auth	OSMA Opinion	CxP Impl'n	CxP Discipline	CxP Doc	CxP Doc Para	CxP Doc Req
NASA STD 8719.10	0	46813	NASA Standard 8719.10 is represented by this single entry. If this entry is being viewed from a filter, list, or traceability report, then the metadata applies to the document as a whole and the document should be reviewed at <a href="http://www.hq.nasa.gov/office/codeq/doctree/871910.htm">http://www.hq.nasa.gov/office/codeq/doctree/871910.htm</a>	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NASA STD 8719.11	0	46814	NASA Standard 8719.11 is represented by this single entry. If this entry is being viewed from a filter, list, or traceability report, then the metadata applies to the document as a whole.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NASA STD 8719.17	0	46815	NASA Standard 8719.17 is represented by this single entry. If this entry is being viewed from a filter, list, or traceability report, then the metadata applies to the document as a whole.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NASA STD 8719.7	0	46811	NASA Standard 8719.7 is represented by this single entry. If this entry is being viewed from a filter, list, or traceability report, then the metadata applies to the document as a whole.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	1.3	40357	Applicability: Compliance with this standard is mandatory for all NASA-owned and NASA contractor-supplied equipment used in support of NASA operations at NASA installations and NASA operations in host countries. The individual installation Lifting Devices and Equipment Manager (LDEM) and safety organizations are responsible for implementation and enforcement. This document establishes minimum requirements; NASA installations should assess their individual programs and develop additional requirements as needed. The need for compliance with this standard at contractor installations performing NASA work should be evaluated and made a contractual requirement where deemed necessary by the contracting officer and the responsible NASA installation/program safety office. Rented or leased LDE is exempt from this standard only by the decision of the contracting officer, the responsible NASA installation/program safety office, and the LDEM. If determined that rented or leased LDE will be used for a critical lift, this standard applies.	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.3.2	40359	Applicability: The design/hardware requirements contained in this document are applicable to new lifting devices/equipment purchased after 6 months from the issue date of this document. Existing equipment and that purchased during the first 6 months from issue of this document shall be reviewed for compliance with all design/hardware aspects of this standard within 12 months of its issue and the need to update such equipment shall be evaluated.	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.3.3	40360	Applicability: Deviations/waivers from the requirements of this document (including design/hardware requirements for both new and existing equipment) shall be approved as outlined in paragraph 1.7. The deviation/waiver documentation shall include any alternate or special criteria or procedures that will be imposed to ensure safe design and operations for those devices that do not meet the applicable requirements.	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.3.4	40361	Applicability: Portions of this standard refer to various national consensus codes/standards for equipment design/hardware requirements (e.g., ASME, CMAA, etc.). Lifting devices and equipment purchased after the initial review required in paragraph 1.3.2 shall comply with the specified codes/standards in effect at the time of manufacture. Each installation shall periodically review subsequent codes/standards and evaluate the need to update existing equipment. Based on an evaluation of NASA's overall safe lifting program and any significant changes in the consensus codes/standards, the NASA Safety and Risk Management Division with concurrence from the field installations shall decide when the next complete review (as described in paragraph 1.3.2) is warranted.	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	1.4	40362	Relation to Occupational and Safety Health Administration (OSHA) Requirements: This document is not a substitute for OSHA requirements. OSHA requirements apply to all NASA operations. This document meets or exceeds Federal OSHA requirements. Some States have their own OSHA programs that must comply with Federal OSHA and may be stricter. All NASA installations are responsible for keeping up to date with the Federal and State OSHA requirements that apply to their operations. This standard contains some OSHA requirements where deemed necessary to stress the importance of the requirement, clarify the requirement, document interpretation of the requirement, and/or define NASA's program for meeting the requirement. The NASA Safety and Risk Management Division, with assistance from the field installations, shall monitor subsequent OSHA requirements for any impact on NASA's safe lifting program.	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.5.1	40364	Critical and Noncritical Lifting Operations: Critical lifts are lifts where failure/loss of control could result in loss of life, loss of or damage to flight hardware, or a lift involving special high dollar items, such as spacecraft, one-of-a-kind articles, or major facility components, whose loss would have serious programmatic or institutional impact. Critical lifts also include the lifting of personnel with a crane, lifts where personnel are required to work under a suspended load, and operations with special personnel and equipment safety concerns beyond normal lifting hazards. Personnel shall not be located under suspended or moving loads unless the operation adheres to the OSHA-approved NASA Alternate Standard for Suspended Load Operations (see Appendix A). Lifting of personnel with a crane shall be in accordance with 29 CFR 1926.550 (see Appendix C).	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.5.1.a	40365	Critical and Noncritical Lifting Operations: Each installation or program shall develop a process to identify critical lifting operations and lifting devices/equipment that must meet critical lift requirements. Input shall be gathered from facility, program, user, and assurance personnel. The results of the process shall be documented and approved, as a minimum, by the installation LDEM. (Requirement 40365)	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.5.1.b	40366	Critical and Noncritical Lifting Operations: It is NASA policy that the comprehensive safeguards outlined in this standard be provided for critical lifting operations. This includes special design features, maintenance, inspection, and test intervals for the lifting devices/equipment used to make critical lifts.	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.5.1.c	40367	Critical and Noncritical Lifting Operations: Specific written procedures shall be prepared and followed for all critical lifts. (Requirement 40367)	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045

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NASA STD 8719.9	01.5.1.d	40368	Critical and Noncritical Lifting Operations: During critical lifts there shall be one person present (NASA or contractor) that is designated as responsible for the safety of the operations. That person may be a safety professional, a supervisor, an engineer, or a task leader. (Requirement 40368)	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.5.3	40370	Critical and Noncritical Lifting Operations: The requirements for critical and noncritical lifts outlined in this standard shall be followed unless a specific deviation/waiver is approved as outlined in paragraph 1.7. Different levels of risks associated shall be evaluated using the risk determination criteria in NPG 8715.3.	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	1.6	40371	Recordkeeping and Trend Analysis: A data collection system shall be established at each installation or location to support NASA-wide lifting device trend and data analysis. Data entered locally would typically be associated with type and manufacturer of the equipment, age, maintenance history, operational problems and their corrective actions, lifting mishaps, safety notices, inspection discrepancies, waivers, and proof and load test results. (Requirement 40371)	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.7.1	40373	Safety Variances: If a mandatory requirement cannot be met, a safety variance shall be prepared in accordance with NPG 8715.3. (Requirement 40373)	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.7.2	40374	Safety Variances: The NASA variance process does not apply to Federal and applicable State/local regulations (e.g., OSHA, Cal OSHA). Any variance of a Federal or State/local regulation must be approved by the appropriate Federal/State/local agency (e.g., NASA Alternate Safety Standard for Suspended Load Operations approved by OSHA). The NASA Safety and Risk Management Division shall review all proposed safety variances of Federal regulations before submittal for approval.	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.7.3	40375	Safety Variances: Example: A variance request to a requirement in this standard that uses the word shall would be routed through the Center Safety Director for concurrence and approved or denied by the Center Director. A copy would then be sent to the NASA Safety and Risk Management Division within 14 days along with detailed rationale for its approval and other documentation.	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.8.1	40377	Lifting Devices and Equipment Committee: NASA LDE Committee. Each installation Director shall designate in writing at least one person and an alternate, with appropriate background in lifting devices, lifting operations, lifting equipment industry standards and an understanding of lifting safety, as the installation LDEM, to participate as a member of the NASA LDE Committee. The committee is chaired by the Director, Safety and Risk Management Division, or designee, and is responsible for reviewing proposed changes to this standard and addressing general LDE safety issues. The LDEM is responsible for overall management of the installation LDE program, coordinating with appropriate personnel at their installation on lifting issues and providing the NASA LDE Committee with their installation's position on LDE issues. (Requirement 40377)	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	01.8.2	40378	Lifting Devices and Equipment Committee: Installation LDE Committee. Each installation shall establish a LDE Committee, to ensure this standard is understood and applied across other organizations at the installation and to resolve any issues and provide a forum to exchange information. The Installation LDE Committee shall be chaired by the LDEM, with representation from all organizations at the installation that are responsible for and/or involved with LDE. (Requirement 40378)	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NASA STD 8719.9	1.9	40379	Personnel Performing Nondestructive Testing: Personnel performing lifting devices and equipment nondestructive testing (NDT), including visual inspections, shall be qualified and certified in accordance with written practices meeting the requirements contained in American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A, Personnel Qualification and Certification in Nondestructive Testing. (Requirement 40379)	S	I	I	Mgmt			
NASA STD 8719.9	02.2.1(1)	40383	Government Documents: Specifications, Standards, and Handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issuances in effect on date of invitation for bids or request for proposal shall apply.	S	I	I	Mgmt			
NASA STD 8719.9	02.2.2(1)	40385	Other Government Documents, Drawings, and Publications: The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issuances in effect on date of invitation for bids or request for proposal shall apply.	S	I	I	Mgmt			
NASA STD 8719.9	02.3(1)	40387	Non-Government Publications: The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issuances in effect on date of invitation for bids or request for proposals shall apply.	S	I	I	Mgmt			
NASA STD 8719.9	04.2.2.a	40485	Labeling/Tagging of Cranes: The rated load of all cranes shall be plainly marked on each side of the crane. If the crane has more than one hoisting unit, each hoist load block shall be marked with its rated load. This marking shall be clearly legible from the ground floor (OSHA requirement for all overhead cranes). (Requirement 40485)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.2.b	40486	Labeling/Tagging of Cranes: Cranes that have the specified design features, maintenance/inspection, and test intervals to lift critical loads shall be marked conspicuously so that the operator and assurance personnel can distinguish that the crane is qualified for critical lifts. (Requirement 40486)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.2.c	40487	Labeling/Tagging of Cranes: A standard system of labeling shall be established and used throughout the installation. (Requirement 40487)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.2.d	40488	Labeling/Tagging of Cranes: A standard lockout/tagout system shall be established and used throughout the installation to indicate equipment that is not to be used due to inspection discrepancies, ongoing maintenance operations, or other reasons. (Requirement 40488)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.2.f	40490	Labeling/Tagging of Cranes: Each overhead crane shall have the directions of its bridge and trolley movements displayed on the underside of the crane. These directions shall correspond to the directions on the operator station. These markings shall be visible from the floor but are not required if the crane is at such a height the markings would be legible without unaided vision. (Requirement 40490)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.3(1)	40491	Safety Analysis and Documentation of Cranes Used for Critical Lifts: A recognized safety hazard analysis, such as fault tree analysis, FMEA, Operating and Support Hazard Analysis (O&SHA), shall be performed on all cranes used for critical lifts. (Requirement 40491)	S	I	I	Mgmt			

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NASA STD 8719.9	04.2.3(2)	40492	Safety Analysis and Documentation of Cranes Used for Critical Lifts: The analysis shall, as a minimum, determine potential sources of danger, identify failure modes, and recommend resolutions and a system of risk acceptance for those conditions found in the hardware-facility-environment-human relationship that could cause loss of life, personal injury, and loss of or damage to the crane, facility, or load. (Requirement 40492)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.3(3)	40493	Safety Analysis and Documentation of Cranes Used for Critical Lifts: The analysis shall be done as part of the initial evaluation process for critical lift compliance and prior to use in a critical lift, included in the crane documentation, and updated as required to reflect any changes in operation and/or configuration. (Requirement 40493)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.4(1)	40494	Performance: Crane service classification, load capability, and the desired control characteristics with which the crane handles the load shall be addressed for all designs. (Requirement 40494)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.4(2)	40495	Performance: Crane service classification requirements shall be based on the worst expected duty the unit will encounter. (Requirement 40495)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.4(3)	40496	Performance: Operational requirements shall be considered in the design phase to ensure load and function are adequately defined and critical crane design features are incorporated on the delivered units. (Requirement 40496)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.5	40497	Structural: Structural design shall be in accordance with industry standards for material selection, welding, allowable stresses, design limitations, framing, rails, wheels, and other structural elements. Refer to ASME and CMAA standards for specific design details. (Requirement 40497)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.01	40501	Mechanical: The mechanical design requirements for crane components are as follows: They shall meet all applicable requirements of OSHA, ASME, and CMAA. (Requirement 40501)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.02	40502	Mechanical: The mechanical design requirements for crane components are as follows: For critical lift application, speed reduction from the motor to the drum on the hoist should be achieved by enclosure in a gear case. If open gears are required, they shall be guarded with a provision for lubrication and inspection. (Requirement 40502)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.03	40503	Mechanical: The mechanical design requirements for crane components are as follows: Gearing shall be designed and manufactured to comply with the latest AGMA gear standards. (Requirement 40503)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.04	40504	Mechanical: The mechanical design requirements for crane components are as follows: Each hoisting unit shall be provided with at least two means of braking: a holding brake and a control brake. The torque ratings, physical characteristics, and capabilities of the brakes shall be in accordance with CMAA specifications. (Requirement 40504)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.05(1)	40505	Mechanical: The mechanical design requirements for crane components are as follows: For cranes used for critical lifts, two holding brakes shall be provided, each capable of bringing a rated load to zero speed and holding it. (Requirement 40505)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.05(2)	40506	Mechanical: The mechanical design requirements for crane components are as follows: Holding brakes shall be applied automatically when power to the brake is removed. If the control brake and holding brake are designed to operate as a system and cannot independently stop and hold a rated load, then another means of braking is required for cranes used for critical lifts (e.g., emergency brake). (Requirement 40506)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.05(3)	40507	Mechanical: The mechanical design requirements for crane components are as follows: The brakes shall be designed so that they can be tested as required in paragraph 4.3.3.d. (Requirement 40507)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.05(4)	40508	Mechanical: The mechanical design requirements for crane components are as follows: The brake design shall provide for emergency load lowering. (Requirement 40508)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.06(1)	40509	Mechanical: The mechanical design requirements for crane components are as follows: Worm gears shall not be used as a braking means unless the lead angle is sufficient to prevent back driving. (Requirement 40509)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.06(2)	40510	Mechanical: The mechanical design requirements for crane components are as follows: The braking properties of a worm gear tend to degrade with use; the design engineer shall consider this when purchasing new equipment or in existing installations where the hoist is subject to heavy use. (Requirement 40510)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.07(1)	40511	Mechanical: The mechanical design requirements for crane components are as follows: In the procurement of new lifting equipment, the use of cast iron components in the hoist load path shall be approved, as a minimum, by the LDEM and the responsible design engineering organization. (Requirement 40511)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.07(2)	40512	Mechanical: The mechanical design requirements for crane components are as follows: The material properties of cast iron allow catastrophic failure and should not be considered as reliable as steel or cast steel. The engineer shall consider this when selecting equipment and avoid the use of load bearing cast iron materials where possible. (Requirement 40512)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.08(1)	40513	Mechanical: The mechanical design requirements for crane components are as follows: Safe and adequate access to crane components to inspect, service, repair, or replace equipment shall be provided for during design. (Requirement 40513)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.08(2)	40514	Mechanical: The mechanical design requirements for crane components are as follows: The design shall provide for visual and physical accessibility. (Requirement 40514)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.09	40515	Mechanical: The mechanical design requirements for crane components are as follows: Pneumatic cranes shall have the capability to lock out the supply air pressure to prevent unauthorized use. (Requirement 40515)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.10	40516	Mechanical: The mechanical design requirements for crane components are as follows: Based on the sensitivity of the loads to be lifted, cranes shall have appropriate speed modes that provide for safe, smooth starting and stopping to preclude excessive "G" forces from being applied to the load. (Requirement 40516)	S	I	I	Mgmt			

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NASA STD 8719.9	04.2.6.b.11(1)	40517	Mechanical: The mechanical design requirements for crane components are as follows: All wire rope hoists shall have not less than two wraps of hoisting rope on the drum when the hook is in its extreme low position. Drum grooves, when provided, shall be as recommended by CMAA. (Requirement 40517)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.11(2)	40518	Mechanical: The mechanical design requirements for crane components are as follows: The rope ends shall be anchored securely by a clamp or a swaged terminal in a keyhole slot, provided a keeper is used to prohibit the swage from moving out of the narrow slot. Other methods recommended by the hoist or wire rope manufacturer are acceptable if the rope termination anchor together with two wraps of rope on the drum will give an anchor system equal to or greater than the breaking strength of the wire rope. (Requirement 40518)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.12	40519	Mechanical: The mechanical design requirements for crane components are as follows: Malleable iron clips for wire rope termination shall not be used. Forged steel wire rope clips are acceptable. (Requirement 40519)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.13(1)	40520	Mechanical: The mechanical design requirements for crane components are as follows: Manually operated (nonpowered) hoist cranes that are off-the-shelf OEM type are acceptable for critical and noncritical lift applications. They shall comply with applicable ASME requirements. (Requirement 40520)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.13(2)	40521	Mechanical: The mechanical design requirements for crane components are as follows: These hoists shall be equipped with at least one self-setting brake, referred to as a holding brake, applied directly to the motor shaft or some part of the gear train. No limit switches are required if proper over-travel restraint is provided. (Requirement 40521)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.14	40522	Mechanical: The mechanical design requirements for crane components are as follows: Air operated chain hoists can be equipped with over-travel protection devices instead of the hoist travel limit switches.	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.15(1)	40523	Mechanical: The mechanical design requirements for crane components are as follows: Initial and final upper limit switches (limit control valves) shall be provided and tested for critical air operated hoists as described in paragraph 4.2.7.k. (Requirement 40523)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.15(2)	40524	Mechanical: The mechanical design requirements for crane components are as follows: The final upper limit switch (limit control valve) shall exhaust air from the crane hoist, set the brakes, and require reset at the upper limit switch (limit control valve) level. (Requirement 40524)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.b.16	40525	Mechanical: The mechanical design requirements for crane components are as follows: A minimum clearance of 3 inches (7.6 cm) overhead and 2 inches (5.1 cm) laterally shall be provided and maintained between the crane and all obstructions. (Requirement 40525)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.c	40526	Mechanical: When the use of high quality, off-the-shelf, OEM type equipment is not possible due to unique design and operation requirements, then built-up type equipment must be used. These built-up cranes generally use many commercially available or made-to-order motors, brakes, couplings, gear reducers, etc. These components are then custom engineered together as an assembly mounted on custom designed and built equipment frames. In many cases, gear reducers, drums, and drive shafts are custom designed and built. Structural and mechanical parts, such as sheave pins, hook-block components, bridge girders, and bridge and trolley drives are also custom designed and built as components or assemblies. The built-up type crane should only be used where commercial equipment is not available to meet the user/operational requirements described in this paragraph. Due to the nature of its one of a kind design and construction, this type of equipment is generally more prone to break down and should be considered as less reliable than commercial equipment. These units shall meet the mechanical design requirements provided in paragraph 4.2.6.b and	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.c.1(1)	40527	Mechanical: These units shall meet the mechanical design requirements provided in paragraph 4.2.6.b and the following additional minimum requirements: Drum supporting structures should be designed so that bearings are mounted under compression to (1) minimize wearing of the bearings and (2) increase the probability of maintaining the mesh between the drum gear and the drive gear in the case of bearing failure. The structure shall be designed to preclude failure of the bearings and drum supports. (Requirement 40527)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.c.1(2)	40528	Mechanical: These units shall meet the mechanical design requirements provided in paragraph 4.2.6.b and the following additional minimum requirements: Pillow block bearings shall have steel, or cast steel housings (the use of cast iron is not permitted). (Requirement 40528)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.c.2	40529	Mechanical: These units shall meet the mechanical design requirements provided in paragraph 4.2.6.b and the following additional minimum requirements: In descending order of preference, the drum gear when used shall be integrally attached, splined, bolted with close fitting body-bound bolts to a flange on the drum, or pressed on and keyed to either the periphery of the hub or shell of the drum, or attached by other means of equal safety. (Requirement 40529)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.c.3(1)	40530	Mechanical: These units shall meet the mechanical design requirements provided in paragraph 4.2.6.b and the following additional minimum requirements: Couplings shall be located immediately next to bearings. (Requirement 40530)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.c.3(2)	40531	Mechanical: These units shall meet the mechanical design requirements provided in paragraph 4.2.6.b and the following additional minimum requirements: Couplings between closely spaced bearings shall be of a full flexible type with integral gear form or grids, having metal to metal contact, and shall run in oil or be lubricated as recommended by the manufacturer. (Requirement 40531)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.c.3(3)	40532	Mechanical: These units shall meet the mechanical design requirements provided in paragraph 4.2.6.b and the following additional minimum requirements: All couplings for hoists shall be pressed fit with keys. (Requirement 40532)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.6.c.4	40533	Mechanical: These units shall meet the mechanical design requirements provided in paragraph 4.2.6.b and the following additional minimum requirements: Each load-bearing component shall be specified or detailed to lift the maximum imposed loads resulting from zero to rated hook load with appropriate design factors. (Requirement 40533)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.c(1)	40537	Electrical: Electrical design requirements are as follows: Wiring and safety devices shall be in accordance with NFPA National Electrical Code. (Requirement 40537)	S	I	I	Mgmt			

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NASA STD 8719.9	04.2.7.c(2)	40538	Electrical: Electrical design requirements are as follows: Conduit and wiring shall be such that on-site work is minimized. (Requirement 40538)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.c(3)	40539	Electrical: Electrical design requirements are as follows: Hard wire conductors such as festooned cables or articulated cable carriers, instead of power or feed rails, shall be considered to provide power and control to overhead cranes handling explosives or solid propellants, or to cranes with solid state controls. (Requirement 40539)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.d	40540	Electrical: Electrical design requirements are as follows: Electrical enclosures shall provide protection for the contained equipment against environmental conditions according to the class rating established by NEMA. (Requirement 40540)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.f(1)	40542	Electrical: Electrical design requirements are as follows: Control stations shall operate on 150 volts DC, 120 volts AC, or less. (Requirement 40542)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.f(2)	40543	Electrical: Electrical design requirements are as follows: Positive detent pushbuttons or a control lever shall be used for speed control. (Requirement 40543)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.f(3)	40544	Electrical: Electrical design requirements are as follows: Controls shall return to the off position when the operator relieves pressure. (Requirement 40544)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.f(4)	40545	Electrical: Electrical design requirements are as follows: A red, emergency stop pushbutton shall be provided to operate the mainline contactor and/or the main circuit breaker (main breaker preferred). (Requirement 40545)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.f(5)	40546	Electrical: Electrical design requirements are as follows: A positive lockout to the controls shall be provided to ensure the safety of maintenance personnel. (Requirement 40546)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.g(1)	40547	Electrical: Electrical design requirements are as follows: All cab-operated cranes with step type control shall be equipped with lever controls. (Requirement 40547)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.g(2)	40548	Electrical: Electrical design requirements are as follows: The levers shall be of the continuous effect type and provided with a deadman feature that will not unduly tire the operator during lengthy operations. (Requirement 40548)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.h	40549	Electrical: Electrical design requirements are as follows: The electrical system shall be designed fail-safe to ensure that a failure of any component will not cause the crane to operate in a speed range faster than commanded. A failure that causes a speed different from that selected is acceptable provided no hazards are introduced. Failure modes that cause the bridge, trolley, or hoist to slow down or come to a safe stop are acceptable; those that could cause unplanned directional shifts, and/or loss of control are unacceptable. (Requirement 40549)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.j(1)	40551	Electrical: Electrical design requirements are as follows: For cranes used for critical lifts, an assessment shall be performed to determine the operational needs for remote emergency stops independent from the operator controlled emergency stop. Not all cranes used for critical lifts require a remote emergency stop. Remote emergency stops are required for cranes used for critical lifts where the crane operator's view is restricted/obstructed. When provided, this independent remote emergency stop should be located such that the independent remote emergency stop operator(s) can clearly see the critical lift area(s). (Requirement 40551)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.j(2)	40552	Electrical: Electrical design requirements are as follows: The remote emergency stop circuit shall be separate from and take precedence over the operator control circuit. (Requirement 40552)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.j(3)	40553	Electrical: Electrical design requirements are as follows: The control, when activated, shall cause all drives to stop and the brakes to set. Hand-held remote emergency stop pendants should be standardized and should include power and circuit continuity indication. For those cranes required to make critical lifts that have not been modified to provide a remote emergency stop, handling procedures shall be developed and implemented to minimize the risk. (Requirement 40553)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.k	40554	Electrical: Electrical design requirements are as follows: For cranes used for critical lifts, dual upper limit switches are required. For electric cranes, the limit switches shall meet the following requirements:	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.k.1	40555	Electrical: Electrical design requirements are as follows: For electric cranes, the limit switches shall meet the following requirements: Initial upper limit switch electrical contacts shall be a set of normally closed contacts in the "raise" contactor circuit such that movement in the raise direction shall be precluded after the limit switch is encountered. Movement in the "lower" direction will not be inhibited. (Requirement 40555)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.k.2	40556	Electrical: Electrical design requirements are as follows: For electric cranes, the limit switches shall meet the following requirements: Final upper limit switch electrical contacts shall be a set of normally closed electrical contacts wired into the mainline circuit, hoist power circuit, main contactor control circuit, or hoist power contactor control circuit such that all crane motion or all hoist motion shall be precluded after the limit switch is encountered. These normally closed contacts may be located in the low voltage control circuitry. (Requirement 40556)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.k.3	40557	Electrical: Electrical design requirements are as follows: For electric cranes, the limit switches shall meet the following requirements: After a final upper limit switch has been activated, movement of the load will require action (resetting) at the final upper limit switch level. An inspection shall be made to determine the cause of failure of the initial upper limit switch. Stopping crane motion by the above design configuration may result in a hazardous suspended load condition. The crane design should include a means of detecting limit switch failure and allow for safe inspection and repair. For example, a system may be equipped with two different colored annunciator lights, one for each limit switch. A reset button may be included so that when a final upper limit switch is tripped, the load can be lowered immediately. The reset button should be secured to prevent unauthorized use. (Requirement 40557)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.k.4(1)	40558	Electrical: Electrical design requirements are as follows: For electric cranes, the limit switches shall meet the following requirements: The initial upper limit switch shall be adjusted sufficiently low to preclude inadvertent actuation of the final upper limit switch if the hoist actuates the initial upper limit switch at full speed with no load. (Requirement 40558)	S	I	I	Mgmt			

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NASA STD 8719.9	04.2.7.k.4(2)	40559	Electrical: Electrical design requirements are as follows: For electric cranes, the limit switches shall meet the following requirements: Similarly, the final upper limit switch shall be adjusted sufficiently low to ensure that the hoist will not two-block (or otherwise damage wire rope) if the hoist actuates the final upper limit switch at full speed with no load. (Requirement 40559)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.k.4(3)	40560	Electrical: Electrical design requirements are as follows: For electric cranes, the limit switches shall meet the following requirements: Both limits shall be tested from slow speed to full speed to verify correct operation. It should be noted that this requirement effectively lowers the usable hook height of the hoist. (Requirement 40560)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.k.4(4)	40561	Electrical: Electrical design requirements are as follows: For electric cranes, the limit switches shall meet the following requirements: The limit switch arrangement shall be considered during new equipment design. (Requirement 40561)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.L	40562	Electrical: Electrical design requirements are as follows: For cranes used for critical lifts, lower limit switches to prevent reverse winding of the wire rope shall be provided. (Requirement 40562)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.m	40563	Electrical: Electrical design requirements are as follows: Electrical cranes shall have the capability to be locked out at the main breaker to prevent unauthorized use. (Requirement 40563)	S	I	I	Mgmt			
NASA STD 8719.9	04.2.7.n	40564	Electrical: Electrical design requirements are as follows: Cranes shall be designed fail-safe in the event of a power outage. (Requirement 40564)	S	I	I	Mgmt			
NASA STD 8719.9	04.3(1)	40565	Testing: Three types of tests are required for cranes: proof load tests, periodic load tests, and operational tests. The proof load tests and operational tests shall be performed prior to first use for new cranes, or for existing cranes that have had modifications or alterations performed to components in the load path. This applies only to those components directly involved with the lifting or holding capability of a crane that has been repaired or altered. Repairs or alterations to nonlifting, secondary lifting, or holding components such as suspension assemblies, electrical system, crane cab, etc., do not require a load test, although a functional check should be performed to determine if the repairs or alterations are acceptable. (Requirement 40565)	S	I	I	Mgmt			
NASA STD 8719.9	04.3(2)	40566	Testing: The periodic load and operational tests shall be performed at least every 4 years. (Requirement 40566)	S	I	I	Mgmt			
NASA STD 8719.9	04.3(3)	40567	Testing: Cranes used frequently for critical lifts shall be load tested annually. (Requirement 40567)	S	I	I	Mgmt			
NASA STD 8719.9	04.3(4)	40568	Testing: Cranes used infrequently for critical lifts shall be load tested before the critical lift if it has been more than a year since the last test. (Requirement 40568)	S	I	I	Mgmt			
NASA STD 8719.9	04.3(5)	40569	Testing: If a crane is upgraded (increased lifting capacity), a proof load test and an operational test shall be performed based on the upgraded rating. (Requirement 40569)	S	I	I	Mgmt			
NASA STD 8719.9	04.3(6)	40570	Testing: All load and operational tests shall be performed by qualified personnel according to written (specific or general) technical operating procedures. (Requirement 40570)	S	I	I	Mgmt			
NASA STD 8719.9	04.3(7)	40571	Testing: An inspection of the crane and lifting components shall be performed after each load test and prior to the crane being released for service to ensure there is no damage. (Requirement 40571)	S	I	I	Mgmt			
NASA STD 8719.9	04.3(8)	40572	Testing: Surface or volumetric NDT of critical components shall be used to validate the existence or absence of cracks or other load test effects indicated by this inspection. The periodic load test requirement may be fulfilled by a concurrently performed proof load test. (Requirement 40572)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.1(1)	40573	Testing: Proof Load Test: Before first use and after installation, all new, extensively repaired, extensively modified, or altered cranes shall undergo a proof load test with a dummy load as close as possible to, but not exceeding 1.25 times the rated capacity of the crane. A proof load test also should be performed when there is a question in design or previous testing. (Requirement 40573)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.1(2)	40574	Testing: Proof Load Test: The load shall be lifted slowly and in an area where minimal damage will occur if the crane fails. The acceptable tolerance for proof load test accuracy is -5/+0 percent. (Requirement 40574)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.2(1)	40575	Testing: Periodic Load Test: Each crane shall be tested at least once every 4 years with a dummy load equal to the crane's rated capacity. (Requirement 40575)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.2(2)	40576	Testing: Periodic Load Test: Cranes used for critical lifts shall be load tested at least once per year. (Requirement 40576)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.2(3)	40577	Testing: Periodic Load Test: Cranes used infrequently for critical lifts shall be load tested before the critical lift if it has been more than a year since the last test. The acceptable tolerance for periodic load test accuracy is +5/-0 percent. (Requirement 40577)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.3	40578	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified:	S	I	I	Mgmt			
NASA STD 8719.9	04.3.3.a	40579	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: Load hoisting, lowering at various speeds (maximum safe movement up and down as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations), and braking/holding mechanisms. Holding brakes shall be tested to verify stopping capabilities and demonstrate the ability to hold a rated load (see paragraph 4.3.3.d). The load should be held long enough to allow any dynamics to dampen out. (Requirement 40579)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.3.b	40580	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: Trolley and bridge travel (maximum safe movement in all directions with varying speeds as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations). (Requirement 40580)	S	I	I	Mgmt			

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NASA STD 8719.9	04.3.3.c	40581	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: All limit switches, locking devices, emergency stop switches, and other safety devices, excluding thermal overload and circuit breakers. The limit switch, emergency stop, and locking device tests except for the final upper limit switch shall be performed with no load on the hook at full speed. The final upper limit switch can be tested by manually tripping the switch and verifying that all hoist motion is precluded (see paragraph 4.5.2.c). (Requirement 40581)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.3.d	40582	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: Cranes used for critical lifts are required to be equipped with two holding brakes (hoist), each capable of bringing a rated load to zero speed and holding it (see paragraph 4.2.6.b(5)). If a worm gear is used as a holding brake, it shall be tested to ensure it is able to hold a static load and stop a dynamic load. The operational test must demonstrate each brake's ability to stop and hold a rated load. (Requirement 40582) This can be done in one of the following ways:	S	I	I	Mgmt			
NASA STD 8719.9	04.3.3.d.1	40583	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Each brake's ability to hold shall be statically tested (under no load) with 150 percent of the rated load hoisting torque at the point of brake application. (Requirement 40583)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.3.d.2	40584	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Alternately, each brake shall be tested for its ability to stop and hold a rated load in both the raising and lowering modes. (CAUTION: It must be possible to quickly reenergize the out-of-circuit brake or provide other safety measures to perform this test safely.) (Requirement 40584)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.3.d.3	40585	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Other methods as approved by the LDEM with concurrence from the responsible safety, engineering, operations, and maintenance organizations. (Requirement 40585)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.3.e	40586	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: The operational test for a modified crane can be tailored to test those portions of the equipment that were modified only if the normal periodic load and operational test interval has not expired. (Requirement 40586)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.4(1)	40587	Testing: Test reports and Periodic Recertification Tags: After each test, designated personnel shall prepare written, dated, and signed test reports including procedure reference. (Requirement 40587)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.4(2)	40588	Testing: Test reports and Periodic Recertification Tags: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 40588)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.4(3)	40589	Testing: Test reports and Periodic Recertification Tags: These reports shall be kept on file by the owner organization for a minimum of two test cycles and shall be made readily available. (Requirement 40589)	S	I	I	Mgmt			
NASA STD 8719.9	04.3.4(4)	40590	Testing: Test reports and Periodic Recertification Tags: Following the periodic load test, cranes shall be given a permanently affixed tag, posted on the crane or an appropriate location, identifying the equipment and stating the next required periodic load test date or load test expiration date. (Requirement 40590)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.1(1)	40592	Inspection: Inspections, as described below, shall be performed on all cranes and crane accessories. (Requirement 40592)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.1(2)	40593	Inspection: Inspections shall be performed according to this section, the manufacturers' recommendations, and ASME B30.2. (Requirement 40593)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.1(3)	40594	Inspection: Inadequacies discovered during an inspection shall be documented and, if determined to be a hazard, tagged out and corrected prior to further use. (Requirement 40594)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.1(4)	40595	Inspection: Inspections shall be performed by qualified personnel according to approved technical operating procedures. (Requirement 40595)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.2	40596	Inspection: All new, extensively repaired, or modified cranes shall be given a daily and a periodic inspection prior to first use. For component repair on cranes, only the inspections that apply to the repaired portion need to be performed prior to first use unless a periodic inspection interval expires during the downtime (see paragraph 4.4.5). (Requirement 40596)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.3(1)	40597	Inspection: Cranes in regular service (used at least once month) shall be inspected as required in paragraphs 4.4.4 and 4.4.5. (Requirement 40597)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.3(2)	40598	Inspection: Idle and standby cranes shall be inspected according to paragraph 4.4.6. (Requirement 40598)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.4	40599	Inspection: Daily Inspections: These inspections shall be performed and documented by the certified operator prior to first use each day the crane is used, and shall include the following: (Requirement 40599)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.4.a	40600	Inspection: Daily Inspections: These inspections shall be performed and documented by the certified operator prior to first use each day the crane is used, and shall include the following: Check operating and control mechanisms for proper function. (Requirement 40600)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.4.b	40601	Inspection: Daily Inspections: These inspections shall be performed and documented by the certified operator prior to first use each day the crane is used, and shall include the following: Without disassembling, visually inspect lines, tanks, valves, drain pumps, gear casings, and other components of fluid systems for deterioration and leaks. This applies to components that can be seen from the ground level for floor operated cranes and cab operated cranes or for which there is safe access via crane inspection walkways for cab operated cranes. (Requirement 40601)	S	I	I	Mgmt			

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NASA STD 8719.9	04.4.4.c	40602	Inspection: Daily Inspections: These inspections shall be performed and documented by the certified operator prior to first use each day the crane is used, and shall include the following: Without disassembling, visually inspect all functional operating and control mechanisms, including brakes where visible, for excessive wear and contamination by excessive lubricants or foreign matter. (Requirement 40602)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.4.d	40603	Inspection: Daily Inspections: These inspections shall be performed and documented by the certified operator prior to first use each day the crane is used, and shall include the following: Visually inspect hooks for cracks and deformities (see Section 7). (Requirement 40603)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.4.e	40604	Inspection: Daily Inspections: These inspections shall be performed and documented by the certified operator prior to first use each day the crane is used, and shall include the following: Visually (without climbing up to bridge) inspect rope reeving for proper travel and drum lay, and inspect wire rope for obvious kinks, deformation, wire clips, and/or damage. (Requirement 40604)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.4.f	40605	Inspection: Daily Inspections: These inspections shall be performed and documented by the certified operator prior to first use each day the crane is used, and shall include the following: Visually inspect hoist chains for excessive wear or distortion. (Requirement 40605)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5	40606	Inspection: Formal Periodic Inspections: These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality. (Requirement 40606)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.a	40607	Inspection: Formal Periodic Inspections: Monthly Inspections (Frequent Inspections). At least once per month: (Requirement 40607)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.a.1	40608	Inspection: Formal Periodic Inspections: Monthly Inspections (Frequent Inspections). At least once per month: Perform daily inspection requirements described in paragraph 4.4.4. (Requirement 40608)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.a.2	40609	Inspection: Formal Periodic Inspections: Monthly Inspections (Frequent Inspections). At least once per month: Inspect for wear, twist, distortion, or stretch of hoist chains. (Requirement 40609)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.a.3	40610	Inspection: Formal Periodic Inspections: Monthly Inspections (Frequent Inspections). At least once per month: Perform a thorough inspection of all ropes paying particular attention to the signs of deterioration and damage outlined in paragraph 4.5.3.c. (Requirement 40610)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.a.4	40611	Inspection: Formal Periodic Inspections: Monthly Inspections (Frequent Inspections). At least once per month: Inspect for visible deformation or cracks in hooks (see Section 7). (Requirement 40611)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b	40612	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: (Requirement 40612)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.01	40613	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Requirements for monthly inspections (frequent inspections) described in paragraph 4.4.5.a. (Requirement 40613)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.02	40614	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Deformed, cracked, or corroded members and welds and loose bolts or rivets in crane structure and runway. Various methods of nondestructive testing such as ultrasonics, radiography, magnetic particle, or liquid penetrant, shall be used as needed. (Requirement 40614)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.03	40615	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Cracked or worn sheaves and drums. (Requirement 40615)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.04	40616	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Wear or cracks in pins, bearings, shafts, gears, followers, and locking and clamping devices. Surface or volumetric NDT shall be used to validate the existence or absence of cracks indicated by this inspection. (Requirement 40616)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.05	40617	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Wear in brake and clutch system parts, linings, pawls, and ratchets that are readily accessible without major disassembly beyond an acceptable limit. Major teardown to inspect such parts should be based on a frequency consistent with gearbox lubrication analysis and other manufacturers' recommended maintenance programs for these components. (Requirement 40617)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.06	40618	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Inadequacies in load and other indicators over full range. (Requirement 40618)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.07	40619	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Wear in chain drive sprockets and stretch in the chain beyond an acceptable limit. (Requirement 40619)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.08	40620	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Gasoline, diesel, electric, or other power plants for proper performance or noncompliance with applicable safety requirements. (Requirement 40620)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.09	40621	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Evidence of a malfunction in travel, steering, braking, and locking devices. (Requirement 40621)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.10	40622	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Evidence of a malfunction in any safety device. (Requirement 40622)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.11	40623	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Pitting or other signs of deterioration in electrical apparatus. Special attention shall be given to feed rails. (Requirement 40623)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.5.b.12	40624	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Evidence of overheating. (Requirement 40624)	S	I	I	Mgmt			



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NASA STD 8719.9	04.4.6	40625	Inspection: Idle and Standby Cranes: Idle and standby cranes shall be inspected prior to first use according to the requirements of paragraphs 4.4.4 and 4.4.5 unless these daily inspections and formal periodic inspections were performed at required intervals and recorded during the idle/standby period. (Requirement 40625)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.7(1)	40626	Inspection: Inspection Reports: After each formal periodic inspection, qualified, authorized personnel shall prepare written, dated, and signed inspection reports. (Requirement 40626)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.7(2)	40627	Inspection: Inspection Reports: These reports shall include procedure reference and adequacy of the crane/crane components. (Requirement 40627)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.7(3)	40628	Inspection: Inspection Reports: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 40628)	S	I	I	Mgmt			
NASA STD 8719.9	04.4.7(4)	40629	Inspection: Inspection Reports: These reports shall be filed and be made readily available by the organizational element responsible for crane inspection. (Requirement 40629)	S	I	I	Mgmt			
NASA STD 8719.9	04.5(1)	40630	Maintenance: A maintenance program based on manufacturers' recommendations, integrating proactive, reactive, preventive, and predictive maintenance shall be established to increase the probability the crane will function in the required manner over its design life cycle with a minimum of maintenance. (Requirement 40630)	S	I	I	Mgmt			
NASA STD 8719.9	04.5(2)	40631	Maintenance: The program shall include procedures and a scheduling system for normal periodic maintenance items, adjustments, replacements, and repairs. (Requirement 40631)	S	I	I	Mgmt			
NASA STD 8719.9	04.5(3)	40632	Maintenance: The program also shall ensure that records are kept and unsafe test and inspection discrepancies are documented and corrected. (Requirement 40632)	S	I	I	Mgmt			
NASA STD 8719.9	04.5(4)	40633	Maintenance: Any crane found in an unsafe operating condition shall be tagged out and removed from service until repaired. (Requirement 40633)	S	I	I	Mgmt			
NASA STD 8719.9	04.5(5)	40634	Maintenance: All repairs shall be made by qualified personnel in accordance with the manufacturers' instructions. (Requirement 40634)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.1	40635	Maintenance: Maintenance Procedures: Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: (Requirement 40635)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.1.a	40636	Maintenance: Maintenance Procedures: Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: Move crane to an area where maintenance will not interfere with other operations. (Requirement 40636)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.1.b	40637	Maintenance: Maintenance Procedures: Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: Turn off all controls, move main or emergency switch to OPEN, and lock and tag switch in OPEN position unless it is necessary to have power on to perform the maintenance task. (Requirement 40637)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.1.c	40638	Maintenance: Maintenance Procedures: Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: If other cranes are operating on the same runway as the crane being repaired, ensure that proximity limit switches are operating on all cranes or that an observer is stationed to prevent interference with other cranes. (Requirement 40638)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.1.d	40639	Maintenance: Maintenance Procedures: Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: Cranes shall not be operated until all safety devices have been activated and tested/adjusted if involved in the maintenance action. (Requirement 40639)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.2	40640	Maintenance: Adjustments: Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all crane components function properly, paying particular attention to: (Requirement 40640)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.2.a	40641	Maintenance: Adjustments: Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all crane components function properly, paying particular attention to: Brakes. Appropriate precautions shall be taken by inspectors, repair personnel, and others who may be potentially exposed to airborne dust fibers from any asbestos friction materials present in crane braking mechanisms. (Requirement 40641)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.2.b	40642	Maintenance: Adjustments: Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all crane components function properly, paying particular attention to: Control system. (Requirement 40642)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.2.c	40643	Maintenance: Adjustments: Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all crane components function properly, paying particular attention to: Limit Switches. (Requirement 40643)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.2.c.1	40644	Maintenance: Adjustments: Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all crane components function properly, paying particular attention to: Limit switches: The hoist initial upper limit switch shall be verified by running the empty hook at full speed into the limit switch. It is recommended that the switch be verified at slow speed prior to adjustment. (Requirement 40644)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.2.c.2	40645	Maintenance: Adjustments: Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all crane components function properly, paying particular attention to: Limit switches: For cranes used for critical lifts, the final upper limit switch shall be independently verified and adjusted as described above at installation and after modifications that could affect switch operation. The switch can be tested periodically by manually tripping it and verifying that all hoist motion is precluded. (Requirement 40645)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.2.d	40646	Maintenance: Adjustments: Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all crane components function properly, paying particular attention to: Power Plants. (Requirement 40646)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.2.e	40647	Maintenance: Adjustments: Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all crane components function properly, paying particular attention to: Critical operating mechanisms and safety devices. (Requirement 40647)	S	I	I	Mgmt			

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NASA STD 8719.9	04.5.3.a	40649	Maintenance: Repair/Replacements: For repair/replacement requirements for crane hooks with deformation or cracks, see Section 7. If repaired, crane hooks shall be proof load tested using the associated crane proof load value. (Requirement 40649)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.b(1)	40650	Maintenance: Repair/Replacements: Structural members that are cracked, bent, broken, excessively worn, or corroded shall be evaluated by the responsible engineering organization to determine if they should be replaced or repaired. Use proper material and weld/repair procedures according to manufacturers' specifications and ANSI/AWS D14.1. (Requirement 40650)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.b(2)	40651	Maintenance: Repair/Replacements: Any structural repairs/replacements shall be performed with the proper approval/concurrences required by OSHA, the applicable ASME standards, and the manufacturers' requirements. Procedures will be conducted by properly qualified personnel. (Requirement 40651)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c	40652	Maintenance: Repair/Replacements: The need to replace wire rope shall be determined by a certified or otherwise qualified person based on an evaluation of inspection results. Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): (Requirement 40652)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.1	40653	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): In running ropes, twelve randomly distributed broken wires in one rope lay or four broken wires in one strand in one lay or one valley break. (Requirement 40653)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.2	40654	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Individual outside wires with wear of 1/3 the original diameter. (Requirement 40654)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.3	40655	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Kinking, crushing, bird caging, or any other damage resulting in distortion. (Requirement 40655)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.4	40656	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Evidence of heat damage. (Requirement 40656)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.5	40657	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): End connectors that are cracked, deformed, or with evidence of rope pullout. (Requirement 40657)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.6	40658	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Corrosion (internal or external) that results in reduction of rope diameter, or at end connectors. (Requirement 40658)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.7	40659	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: (Requirement 40659)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.7.a	40660	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: 1/64 inch (0.4 mm) for diameters of rope up to 5/16 inch (8.0 mm). (Requirement 40660)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.7.b	40661	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: 1/32 inch (0.8 mm) for diameters 3/8 inch (9.5 mm) to 1/2 inch (13.0 mm). (Requirement 40661)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.7.c	40662	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: 3/64 inch (1.2 mm) for diameters 9/16 inch (14.5 mm) through 3/4 inch (19.0 mm). (Requirement 40662)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.7.d	40663	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: 1/16 inch (1.6 mm) for diameters 7/8 inch (22.0 mm) through 1-1/8 inches (29.0 mm). (Requirement 40663)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.c.7.e	40664	Maintenance: Repair/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: 3/32 inch (2.4 mm) for diameters greater than 1-1/8 inches (29.0 mm). (Requirement 40664)	S	I	I	Mgmt			
NASA STD 8719.9	04.5.3.d	40665	Maintenance: Repair/Replacements: If replaced, the new rope shall be proof load tested using the associated crane proof load value. (Requirement 40665)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.1(1)	40667	Personnel Certification: Program: Only certified (licensed) and trained operators shall be authorized to use/operate cranes. (Requirement 40667)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.1(2)	40668	Personnel Certification: Program: A training, examination, and licensing program shall be established or made available. (Requirement 40668)	S	I	I	Mgmt			

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NASA STD 8719.9	04.6.1(3)	40669	Personnel Certification: Program: For those NASA installations that do not have a training program, all crane operators shall be trained and certified by a recognized crane certification organization that normally performs this function. The operator certification program will be reviewed at least annually to assure that the contents, training material, testing, and examination elements are up-to-date with current methods and techniques; and that any "lessons-learned" are adequately addressed. (Requirement 40669)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.1(4)	40670	Personnel Certification: Program: Riggers (see Section 10) and personnel performing NDT (see paragraph 1.9) shall be certified in their discipline. (Requirement 40670)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.1(5)	40671	Personnel Certification: Program: Training shall be provided to observers and flagmen. (Requirement 40671)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.1(6)	40672	Personnel Certification: Program: All participants in the lifting operation shall have clearly defined roles and responsibilities. (Requirement 40672)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2	40673	Personnel Certification: Levels: Two levels of operator training and proficiency will be established. Operations where critical lifts are involved will require a more rigid operator certification program than those operations that involve more routine lifts that do not involve critical hardware or unique hazards. (Requirement 40673)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a	40674	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: (Requirement 40674)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.1.a	40676	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Training: Classroom training in safety, lifting equipment emergency procedures, general performance standards, requirements, pre-operational checks, and safety-related defects and symptoms (for initial certification and as needed). (Requirement 40676)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.1.b	40677	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Training: Hands-on training (for initial certification and as needed). (Requirement 40677)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.1.c	40678	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Training: An annual review of the items in paragraph 4.6.2.a(1) above. (This may be conducted informally by local supervisory personnel.) (Requirement 40678)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.2.a	40680	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Physical examination (criteria to be determined by the cognizant medical official and should comply with ASME B30.2). (Requirement 40680)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.2.b	40681	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Written examination. (Requirement 40681)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.2.c	40682	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Operational demonstration (for initial certification only). (Requirement 40682)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.2.d	40683	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Proficiency examination for recertification. (Requirement 40683)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.3.a (1)	40685	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: An organizational element shall be designated to issue operator licenses/operator certification. (Requirement 40685)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.3.a (2)	40686	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: Provisions shall be made to revoke licenses for negligence, violations of safety requirements, or failure to meet medical standards. (Requirement 40686)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.3.a (3)	40687	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: Provisions shall be made for periodic checks of operators to verify they have licenses in their possession. (Requirement 40687)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.3.a (4)	40688	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: The licenses shall indicate the type of crane the holder is qualified to operate. Alternately, the organizational element may elect to maintain a master list of licensed operators instead of issuing individual licenses, providing copies of the list are readily available to assurance and supervisory personnel at the work site. (Requirement 40688)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.a.3.b	40689	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: Renewal of all licenses shall require demonstration of proficiency or approval of supervision that proficiency is adequate and current. Licenses or certifications will expire at least every 4 years. Renewal procedures will be established by each licensing organization but, as a minimum, will include items in paragraphs 4.6.2.a.(1) and 4.6.2.a.(2). (Requirement 40689)	S	I	I	Mgmt			
NASA STD 8719.9	04.6.2.b	40690	Personnel Certification: Levels: Critical Lifts. Besides the training, examination, licensing, and renewal requirements for noncritical lifts, operators that are being certified to perform critical lifts must be trained in the specific hazards and special procedures associated with the lift. Operators also must demonstrate proficiency and operating finesse with the crane using a test load as appropriate for the initial certification or alternately be directly supervised by a certified operator during the first initial lifting period. The licenses will indicate specific cranes for which the operator is certified. (Requirement 40690)	S	I	I	Mgmt			
NASA STD 8719.9	04.7(1)	40691	Operations: Cranes shall be operated according to this section, the manufacturers' recommendations, and ASME B30.2. (Requirement 40691)	S	I	I	Mgmt			
NASA STD 8719.9	04.7(2)	40692	Operations: The following practices shall be followed for crane operations: (Requirement 40692)	S	I	I	Mgmt			

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NASA STD 8719.9	04.7.a(1)	40693	Operations: The following practices shall be followed for crane operations: General operating procedures describing crane operation, emergency steps, communication requirements, and special requirements including checklists and inspection requirements shall be prepared, approved, and followed for each crane. There must be a formal system for review, approval, and update to maintain valid operating procedures. (Requirement 40693)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.a(2)	40694	Operations: The following practices shall be followed for crane operations: Emergency procedures shall be developed for contingency actions such as power loss, brake failure, or other emergencies (also, see paragraph 1.5.1.c). (Requirement 40694)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.aa(1)	40695	Operations: The following practices shall be followed for crane operations: Crane crew discipline shall be maintained at all times during a crane operation. (Requirement 40695)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.aa(2)	40696	Operations: The following practices shall be followed for crane operations: There shall be no eating, drinking, or rowdiness during crane operation. (Requirement 40696)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.ab	40697	Operations: The following practices shall be followed for crane operations: Outdoor hoisting operations should not commence if winds are above 20 knots (23 mph, 37 km/hr) steady state or if gusts exceed 35 knots (40 mph, 65 km/hr). Consideration shall also be given to sail area and weather conditions such as lightning or snow before commencing operations. (Requirement 40697)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.ac	40698	Operations: The following practices shall be followed for crane operations: A carbon dioxide, dry chemical, or equivalent fire extinguisher shall be kept in the cab or in the immediately available vicinity of the crane. (Requirement 40698)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.ad	40699	Operations: The following practices shall be followed for crane operations: Wire rope should be used in accordance with the Wire Rope Users Manual. (Requirement 40699)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.b(1)	40700	Operations: The following practices shall be followed for crane operations: Operations shall be analyzed for hazards. (Requirement 40700)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.b(2)	40701	Operations: The following practices shall be followed for crane operations: The analysis shall consider the environment in which the operation occurs, hazards associated with crane maintenance, and, in general, a safety analysis of the equipment, facility, load, human factors, and interfaces as a whole in support of the lifting operation. (Requirement 40701)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.c	40702	Operations: The following practices shall be followed for crane operations: Methods and procedures shall be developed for lowering a load in the event of crane failure or other contingencies. These should be demonstrated and verified if practical. (Requirement 40702)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.d	40703	Operations: The following practices shall be followed for crane operations: A crane shall not be loaded beyond its rated load (capacity) except for required testing. (Requirement 40703)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.e(1)	40704	Operations: The following practices shall be followed for crane operations: Cranes shall not be used to load test items such as slings, platforms, or lifting fixtures unless specifically identified to do so based on a specified percentage of rated load, and a safety analysis approved by the LDEM and the responsible safety, engineering, operations, and maintenance organizations. (Requirement 40704)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.e(2)	40705	Operations: The following practices shall be followed for crane operations: Test procedures shall be approved by the responsible safety, engineering, operations, and maintenance organizations. This is to ensure that the crane is not damaged due to sudden unloading should the test article fail. (Requirement 40705)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.e(3)	40706	Operations: The following practices shall be followed for crane operations: Appendix D, crane/hoist requirements to load test other lifting equipment, shall be followed. (Requirement 40706)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.f	40707	Operations: The following practices shall be followed for crane operations: Cranes shall not be used for side pulls unless specifically designed to do so. (Requirement 40707)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.g(1)	40708	Operations: The following practices shall be followed for crane operations: There shall be a system for documenting crane problems/discrepancies. (Requirement 40708)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.g(2)	40709	Operations: The following practices shall be followed for crane operations: Prior to an operation, the operator shall review any previously noted problems/discrepancies to determine possible impact on planned activity. (Requirement 40709)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.h(1)	40710	Operations: The following practices shall be followed for crane operations: The operator shall ensure that the crane is within inspection and testing intervals by examination of the periodic recertification test tags and/or documentation. (Requirement 40710)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.h(2)	40711	Operations: The following practices shall be followed for crane operations: The operator shall adhere to all tags placed on the crane controls. (Requirement 40711)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.i(1)	40712	Operations: The following practices shall be followed for crane operations: Before each lift or series of lifts, the operator shall perform a pre-operational check to demonstrate operational readiness. If controls do not operate properly, the operator is responsible for notifying the supervisor. (Requirement 40712)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.i(2)	40713	Operations: The following practices shall be followed for crane operations: Repairs and adjustments shall be made before operations begin. (Requirement 40713)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.j(1)	40714	Operations: The following practices shall be followed for crane operations: The operator shall establish safety zones before initiating operations. Safety zones should have appropriate barriers (rope, cones, or other) established prior to lift. Personnel on the crane should be minimized during crane movement. (Requirement 40714)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.j(2)	40715	Operations: The following practices shall be followed for crane operations: Any personnel on the crane shall be made aware of and avoid pinch points at their respective location. (Requirement 40715)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.k(1)	40716	Operations: The following practices shall be followed for crane operations: Before each lift or series of lifts, the operator shall functionally test proper operation of the upper limit switch with no load on the hook. (Requirement 40716)	S	I	I	Mgmt			

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NASA STD 8719.9	04.7.k(2)	40717	Operations: The following practices shall be followed for crane operations: Upper limit switches shall not be used as operating controls. (Requirement 40717)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.L(1)	40718	Operations: The following practices shall be followed for crane operations: Before starting to hoist, the following conditions shall be noted: the hoist rope shall not be kinked, (Requirement 40718)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.L(2)	40719	Operations: The following practices shall be followed for crane operations: Before starting to hoist, the following conditions shall be noted: multiple part ropes shall not be twisted around each other, (Requirement 40719)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.L(3)	40720	Operations: The following practices shall be followed for crane operations: Before starting to hoist, the following conditions shall be noted: and the hook shall be centered over the load in such a manner as to prevent swinging or side pulls. (Requirement 40720)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.m(1)	40721	Operations: The following practices shall be followed for crane operations: The operator shall know the weight of the working load. (Requirement 40721)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.m(2)	40722	Operations: The following practices shall be followed for crane operations: When raising loads that approach 75% of the rated capacity of the crane, the operator shall test the holding brakes. (Requirement 40722)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.m(3)	40723	Operations: The following practices shall be followed for crane operations: The brakes shall be tested by raising the load minimally above the surface and holding the load with the brake. The load should be held long enough to allow any dynamics to dampen out. (Requirement 40723)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.n(1)	40724	Operations: The following practices shall be followed for crane operations: If radio communications are to be used, operators and/or lift supervisors shall test the communication system prior to each operation. (Requirement 40724)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.n(2)	40725	Operations: The following practices shall be followed for crane operations: Operations shall stop immediately upon communication loss and shall not continue until communication is restored. (Requirement 40725)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.o(1)	40726	Operations: The following practices shall be followed for crane operations: If hand signals are required, only standard signals shall be used according to Appendix B. (Requirement 40726)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.o(2)	40727	Operations: The following practices shall be followed for crane operations: Hand signals shall be posted in a conspicuous location. (Requirement 40727)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.q	40729	Operations: The following practices shall be followed for crane operations: If there is a slack rope condition, it shall be determined that the rope is properly seated on the drum and in the sheaves before starting the hoist. (Requirement 40729)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.r	40730	Operations: The following practices shall be followed for crane operations: During hoisting, care shall be taken that there is no sudden acceleration or deceleration of the moving load and that the load does not contact any obstructions. (Requirement 40730)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.s(1)	40731	Operations: The following practices shall be followed for crane operations: Loads shall be secured, balanced, and controlled with proper slings. (Requirement 40731)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.s(2)	40732	Operations: The following practices shall be followed for crane operations: The use of tag lines to keep the load stabilized shall be required whenever load swinging is anticipated to be a viable hazard. (Requirement 40732)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.s(3)	40733	Operations: The following practices shall be followed for crane operations: Tag line personnel shall take care not to impart undesirable motion to the load. (Requirement 40733)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.t(1)	40734	Operations: The following practices shall be followed for crane operations: Person(s) shall not ride the hook or load at anytime. (Requirement 40734)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.t(2)	40735	Operations: The following practices shall be followed for crane operations: If conventional means of reaching a worksite such as an aerial platform, ladder, stairs, or scaffold would be more hazardous or not possible because of structural design or worksite conditions, 29 CFR 1926.550 and ASME B30.23 shall be followed for lifting of personnel with a crane, which is considered a critical lift (see Appendix C). (Requirement 40735)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.u	40736	Operations: The following practices shall be followed for crane operations: Personnel shall not be located under suspended or moving loads unless the operation adheres to the OSHA-approved NASA Alternate Standard for Suspended Load Operations (see Appendix A). (Requirement 40736)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.v	40737	Operations: The following practices shall be followed for crane operations: The load shall not be lowered below the point where less than two full wraps of rope remain on the hoist drum. (Requirement 40737)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.w	40738	Operations: The following practices shall be followed for crane operations: A responsible person shall be in charge of the operation and shall instruct all personnel involved in the proper positioning, rigging, and moving to be done. (Requirement 40738)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.x(1)	40739	Operations: The following practices shall be followed for crane operations: An operator shall be at the crane controls at all times while a load is suspended (OSHA requirement). (Requirement 40739)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.x(2)	40740	Operations: The following practices shall be followed for crane operations: Due to the length of some NASA operations, an operator change may be required while a load is suspended. This shall be accomplished via a procedure designed for the specific crane and operation, ensuring that the crane controls are manned at all times. (Requirement 40740)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.y(1)	40741	Operations: The following practices shall be followed for crane operations: Hands shall be free from encumbrances while personnel are using crane ladders. (Requirement 40741)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.y(2)	40742	Operations: The following practices shall be followed for crane operations: Articles that are too large to be carried in pockets or belts shall be lifted and lowered by handline. (Requirement 40742)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.z(1)	40743	Operations: The following practices shall be followed for crane operations: Necessary clothing and personal belongings in crane cab shall be stored so as not to interfere with access or operations. (Requirement 40743)	S	I	I	Mgmt			
NASA STD 8719.9	04.7.z(2)	40744	Operations: The following practices shall be followed for crane operations: Tools, oil can, waste, extra fuses, and other necessary articles shall be stored properly and shall not be permitted to lie loose in the cab or on the crane. (Requirement 40744)	S	I	I	Mgmt			

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NASA STD 8719.9	04.7.z(3)	40745	Operations: The following practices shall be followed for crane operations: Operators shall be familiar with the operation and care of the fire extinguisher provided. (Requirement 40745)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1	40747	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's. (Requirement 40747)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1.a(1)	40748	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: DOT-packaged explosives shall be handled in accordance with approved hazardous operating procedures. (Requirement 40748)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1.a(2)	40749	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: Barricades and warning signs shall be erected to control access. (Requirement 40749)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1.b(1)	40750	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: Explosives and EED's that are not within DOT-approved containers shall be handled in accordance with approved hazardous operations procedures. (Requirement 40750)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1.b(2)	40751	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: (Requirement 40751)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1.b.1	40752	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: Voltage checks on crane hooks that will handle explosives or EED's shall be performed prior to the start of operations; all crane motions shall be checked. (Requirement 40752)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1.b.2(1)	40753	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: For static sensitive systems, the crane hook shall be connected to facility ground before connecting to explosives or EED's. (Requirement 40753)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1.b.2(2)	40754	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: Electrical grounding of the hook and load shall be accomplished prior to lifting operations. If a ground connection must be disconnected to facilitate operations, an alternate ground should be connected prior to disconnecting the existing ground. The final attachment/detachment must be at least 10 feet (3 m) from exposed propellant grain, explosives, or EED's. (Requirement 40754)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1.b.3	40755	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: The danger potential for radio transmissions near explosives shall be evaluated prior to the operation. (Requirement 40755)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1.b.4	40756	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: Personnel limits, protective clothing, warning signs and barricades shall be used as required. (Requirement 40756)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.1.b.5	40757	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: Safety surveillance requirements shall be followed. (Requirement 40757)	S	I	I	Mgmt			
NASA STD 8719.9	04.8.2	40758	Special Criteria: Policy shall be developed and enforced for crane operation during electrical storms. Operations are generally permitted without restriction within enclosed metal or framed buildings that are properly grounded. Restrictions are necessary for outside operations or for those that cannot tolerate power failure/loss. (Requirement 40758)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.2.a	40764	Safety and Design Aspects: Labeling/Tagging of Mobile Cranes and Derricks: The minimum radius/maximum load capacity of the crane/derrick shall be clearly marked to be legible from the operator's or user's position. For cranes/derricks with separate lifting systems of different ratings, the markings will indicate the lifting capabilities of each system (e.g., main hook, whip hook, and auxiliary hook). (Requirement 40764)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.2.b	40765	Safety and Design Aspects: Labeling/Tagging of Mobile Cranes and Derricks: Mobile cranes and derricks that have the specified design features, maintenance/inspection, and test intervals to lift critical loads shall be marked conspicuously so that the operator and assurance personnel can distinguish that the crane/derrick is qualified for critical lifts. (Requirement 40765)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.2.c	40766	Safety and Design Aspects: Labeling/Tagging of Mobile Cranes and Derricks: A standard system of labeling shall be established and used throughout the installation. (Requirement 40766)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.2.d	40767	Safety and Design Aspects: Labeling/Tagging of Mobile Cranes and Derricks: A standard lockout/tagout system shall be established and used throughout the installation to indicate equipment that is not to be used due to inspection discrepancies, ongoing maintenance operations, or other reasons. (Requirement 40767)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.2.e	40768	Safety and Design Aspects: Labeling/Tagging of Mobile Cranes and Derricks: Certification/recertification tags are required as described in paragraph 5.3.4. (Requirement 40768)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.3(1)	40769	Safety and Design Aspects: Safety Analysis and Documentation of Mobile Cranes and Derricks Used for Critical Lifts: A recognized safety hazard analysis such as fault tree analysis, FMEA, O&SHA shall be performed on all mobile cranes and derricks used for critical lifts. (Requirement 40769)	S	I	I	Mgmt			

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NASA STD 8719.9	05.2.3(2)	40770	Safety and Design Aspects: Safety Analysis and Documentation of Mobile Cranes and Derricks Used for Critical Lifts: The analysis shall, as a minimum, determine potential sources of danger, identify failure modes, and recommend resolutions and a system of risk acceptance for those conditions found in the hardware-facility-environment-human relationship that could cause loss of life, personal injury, and loss of or damage to the crane/derrick, facility, or load. (Requirement 40770)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.3(3)	40771	Safety and Design Aspects: Safety Analysis and Documentation of Mobile Cranes and Derricks Used for Critical Lifts: The analysis shall be done as part of the initial evaluation process for critical lift compliance and prior to use in a critical lift, included in the equipment documentation, and updated as required to reflect any changes in operation and/or configuration. (Requirement 40771)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.4(1)	40772	Safety and Design Aspects: Performance: Load capability and the desired controlled characteristics with which the crane/derrick handles the load shall be addressed for all designs. (Requirement 40772)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.4(2)	40773	Safety and Design Aspects: Performance: Operational requirements shall be considered in the design phase to ensure load and function are adequately defined and critical crane/derrick design features are incorporated on the delivered units. (Requirement 40773)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.5	40774	Safety and Design Aspects: Structural: Structural design shall be in accordance with industry standards for material selection, welding, allowable stresses, design limitations, framing, wheels, and other structural elements. Refer to ASME and PCSA standards for specific design details. (Requirement 40774)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6	40775	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: (Requirement 40775)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.a	40776	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: They shall meet all applicable requirements of OSHA, ASME, and PCSA. (Requirement 40776)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.b	40777	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: The drum gear shall be pressed on and keyed to either the periphery of the hub or shell of the drum, bolted with close fitting milled body bolts to a flange on the drum, or attached by other means of equal safety. (Requirement 40777)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.c	40778	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: Gearing shall be designed and manufactured to comply with the latest AGMA gear standards. (Requirement 40778)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.d(1)	40779	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: Couplings shall be located immediately adjacent to bearings. (Requirement 40779)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.d(2)	40780	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: Couplings between closely spaced bearings shall be of the full flexible type with internal gear form or grids, having metal-to-metal contact, and shall run in oil or be lubricated as recommended by the manufacturer. (Requirement 40780)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.d(3)	40781	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: All couplings for hoists shall be pressed fit with keys. (Requirement 40781)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.e	40782	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: The rated load of a hoisting rope shall not exceed the rope's breaking strength divided by 3.5. (Requirement 40782)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.f(1)	40783	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: Hoists shall be provided with at least two means of braking: a holding brake and a control brake. (Requirement 40783)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.f(2)	40784	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: The torque ratings, physical characteristics, and capabilities of the brakes shall be in accordance with industry standards. (Requirement 40784)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.g(1)	40785	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: For mobile cranes and derricks used for critical lifts, two holding brakes shall be provided, each capable of bringing a rated load to zero speed and holding it. (Requirement 40785)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.g(2)	40786	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: The brakes shall be designed so that they can be tested as required in paragraph 5.3.3.f. This may be accomplished by the following means: (Requirement 40786)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.g.1(1)	40787	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: The brakes shall be designed so that they can be tested as required in paragraph 5.3.3.f. This may be accomplished by the following means: When brakes and clutches are used to control the motion of the hoist drum, two independent means of braking shall be provided: a service brake and an emergency brake. (Requirement 40787)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.g.1(2)	40788	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: The brakes shall be designed so that they can be tested as required in paragraph 5.3.3.f. This may be accomplished by the following means: The service brake shall be capable of functioning with power, and the emergency brake shall set in the event of a power failure. (Requirement 40788)	S	I	I	Mgmt			

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NASA STD 8719.9	05.2.6.g.2	40789	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: The brakes shall be designed so that they can be tested as required in paragraph 5.3.3.f. This may be accomplished by the following means: For load hoists equipped with an mechanically linked hydraulic motor/brake combination, the use of a counterbalance valve that locks the hydraulic fluid when the valve is in the neutral position is an acceptable braking means. If a free fall clutch is present in the hoist design between the hydraulic motor and planetary disc, then a second, independent holding or control brake is required. (Requirement 40789)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.h	40790	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: A positive ratchet and pawl shall be provided on all boom hoist drum(s). (Requirement 40790)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.i	40791	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: Mobile cranes and derricks with booms shall be equipped with a boom angle indicator, where applicable, to assist the operator in ensuring that the crane/derrick is not loaded beyond the rated load for any given configuration. (Requirement 40791)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.j(1)	40792	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: Safe and adequate access to components to inspect, service, repair, or replace equipment shall be provided for during design. (Requirement 40792)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.j(2)	40793	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: The design shall provide for visual and physical accessibility. (Requirement 40793)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.k(1)	40794	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: All wire rope hoists shall be designed to have not less than two wraps of hoisting rope on the drum when the hook is in its extreme low position. (Requirement 40794)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.k(2)	40795	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: Drum grooves shall be provided as recommended by PCSA Standards No. 4 and No. 5. (Requirement 40795)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.k(3)	40796	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: The rope ends shall be anchored securely by a clamp or a swaged terminal in a keyhole slot, provided a keeper is used to prohibit the swage from moving out of the narrow slot. Other methods recommended by the hoist or wire rope manufacturer are acceptable if the rope termination anchor together with two wraps of rope on the drum will give an anchor system equal to or greater than the breaking strength of the wire rope. (Requirement 40796)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.6.L	40797	Safety and Design Aspects: Mechanical: The mechanical design requirements for mobile crane and derrick components are as follows: Each load bearing component shall be designed to sustain the maximum imposed loads with appropriate design factors. (Requirement 40797)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.7	40798	Safety and Design Aspects: Electrical: Electrical design requirements are as follows: (Requirement 40798)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.7.a	40799	Safety and Design Aspects: Electrical: Electrical design requirements are as follows: Wiring and safety devices shall be in accordance with the NFPA National Electrical Code. (Requirement 40799)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.7.b	40800	Safety and Design Aspects: Electrical: Electrical design requirements are as follows: Electrical enclosures shall provide protection for the contained equipment against environmental conditions. (Requirement 40800)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.7.c	40801	Safety and Design Aspects: Electrical: Electrical design requirements are as follows: In addition to overload protection required by the National Electrical Code, undervoltage and phase reversal should be considered. (Requirement 40801)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.7.d	40802	Safety and Design Aspects: Electrical: Electrical design requirements are as follows: The electrical system shall be designed fail-safe to ensure that a failure of any component will not cause the crane/derrick to operate in a speed range faster than commanded. A failure that would cause the crane/derrick to go to a slower speed is acceptable as long as the stop function is still available. Failure modes that could cause unplanned directional shifts and/or loss of control are unacceptable. (Requirement 40802)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.7.e	40803	Safety and Design Aspects: Electrical: Electrical design requirements are as follows: Provisions for grounding the hook are required for handling explosives, solid propellants, flammables, or any other load that requires a nonelectrical or static-free environment. See paragraph 5.8 for handling explosives or EED's. (Requirement 40803)	S	I	I	Mgmt			
NASA STD 8719.9	05.2.7.f	40804	Safety and Design Aspects: Electrical: Electrical design requirements are as follows: Mobile crane anti-two-blocking features shall be in accordance with ASME B30.5. (Requirement 40804)	S	I	I	Mgmt			
NASA STD 8719.9	05.3(1)	40805	Testing: Three types of tests are required for mobile cranes and derricks: proof load tests, periodic load tests, and operational tests. The proof load tests and operational tests shall be performed prior to first use for new, extensively repaired, or altered cranes and derricks. This applies only to those comonents directly involved with the lifting or holding capability of a crane/derrick that has been repaired or altered. Repairs or alterations to nonlifting, secondary lifting, or holding components such as suspension assemblies, electrical system, or crane cab do not require a load test, although a functional check should be performed to determine if the repairs or alterations are acceptable. (Requirement 40805)	S	I	I	Mgmt			
NASA STD 8719.9	05.3(2)	40806	Testing: The periodic load and operational tests shall be performed at least every 4 years. (Requirement 40806)	S	I	I	Mgmt			
NASA STD 8719.9	05.3(3)	40807	Testing: Cranes and derricks used frequently for critical lifts shall be load tested annually. (Requirement 40807)	S	I	I	Mgmt			
NASA STD 8719.9	05.3(4)	40808	Testing: Cranes and derricks used infrequently for critical lifts shall be load tested before the critical lift if it has been more than a year since the last test. (Requirement 40808)	S	I	I	Mgmt			



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NASA STD 8719.9	05.3(5)	40809	Testing: If a crane/derrick is upgraded, a proof load test and an operational test shall be performed based on the upgraded rating. (Requirement 40809)	S	I	I	Mgmt			
NASA STD 8719.9	05.3(6)	40810	Testing: All load and operational tests shall be performed by qualified personnel according to written (specific or general) technical operating procedures. (Requirement 40810)	S	I	I	Mgmt			
NASA STD 8719.9	05.3(7)	40811	Testing: An inspection of the crane/derrick and lifting components shall be performed after each load test and prior to the crane/derrick being released for service to ensure there is no damage. (Requirement 40811)	S	I	I	Mgmt			
NASA STD 8719.9	05.3(8)	40812	Testing: Surface or volumetric NDT of critical components shall be used to validate the existence or absence of cracks or other load test effects indicated by this inspection. The periodic load test requirement may be fulfilled by a concurrently performed proof load test. (Requirement 40812)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.1(1)	40813	Testing: Proof Load Test: Before first use, all new, extensively repaired, extensively modified or altered cranes and derricks shall undergo a proof load test. A proof load test also should be performed when there is a question in design or previous testing. (Requirement 40813)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.1(2)	40814	Testing: Proof Load Test: Mobile cranes and derricks shall be tested at the minimum practical working radius (and maximum working radius for new cranes and derricks only), without interfering with crane structure with a load as close as possible to, but not exceeding 1.10 times the rated load at the given radius. (Requirement 40814)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.1(3)	40815	Testing: Proof Load Test: The load shall be lifted slowly and in an area where minimal damage will occur if the crane/derrick fails. Proof load tests conducted by the manufacturer prior to delivery are acceptable if the necessary load test papers are provided to verify the extent and thoroughness of the test on that specific item. The acceptable tolerance for proof load test accuracy is -5/+0 percent. (Requirement 40815)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.2(1)	40816	Testing: Periodic Load Test: Each mobile crane/derrick shall be tested at least once every 4 years with a dummy load equal to the rated capacity of the crane/derrick at the minimum practical working radius, without interfering with crane structure, according to the manufacturer's load chart. (Requirement 40816)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.2(2)	40817	Testing: Periodic Load Test: Cranes/derricks used for critical lifts shall be load tested at least once per year. (Requirement 40817)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.2(3)	40818	Testing: Periodic Load Test: Cranes/derricks used infrequently for critical lifts shall be load tested prior to the critical lift if it has been over a year since the last load test. (Requirement 40818)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.2(4)	40819	Testing: Periodic Load Test: A periodic load test shall be performed after each boom change (when boom disassembly/assembly is required) if the crane/derrick is to be used for critical lifts. The acceptable tolerance for periodic load test accuracy is +5/0 percent. (Requirement 40819)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.3	40820	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: (Requirement 40820)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.3.a	40821	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: Load hoisting, lowering at various speeds with the boom at the minimum radius (maximum safe movement up and down as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations), and braking/holding mechanisms. Holding brakes shall be tested to verify stopping capabilities and demonstrate the ability to hold a rated load (see paragraph 5.3.3.f). The load should be held long enough to allow any dynamics to dampen out. (Requirement 40821)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.3.b	40822	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: Boom hoisting and lowering through full safe operating range as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations. (Requirement 40822)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.3.c	40823	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: Swinging and traveling mechanisms. (Requirement 40823)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.3.d	40824	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: Boom extension and retraction mechanism on telescoping boom cranes. (Requirement 40824)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.3.e	40825	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: All limit switches, locking devices, emergency stop switches, boom angle indicators, and other safety devices, excluding thermal overload and circuit breakers. The limit switch tests shall be performed with no load on the hook. (Requirement 40825)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.3.f	40826	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: Cranes and derricks used for critical lifts are required to be equipped with two holding brakes (hoist), each capable of bringing a rated load to zero speed and holding it (see paragraph 5.2.6.g). If a worm gear is used as a holding brake, it shall be tested to ensure it is able to hold a static load and stop a dynamic load. The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: (Requirement 40826)	S	I	I	Mgmt			

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NASA STD 8719.9	05.3.3.f.1	40827	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Each brake's ability to hold shall be statically tested (under no load) with 150 percent of the rated load hoisting torque at the point of brake application. (Requirement 40827)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.3.f.2	40828	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Alternately, each brake shall be tested for its ability to stop and hold a rated load in both the raising and lowering modes. (CAUTION: It must be possible to quickly reenergize the out-of-circuit brake or provide other safety measures to perform this test safely.) (Requirement 40828)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.3.f.3	40829	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Other methods may be used as approved by the LDEM with concurrence from the responsible safety, engineering, operations, and maintenance organizations. (Requirement 40829)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.3.g	40830	Testing: Operational Test: Together with proof load and periodic load tests, the following shall be performed with a dummy rated load, unless otherwise specified, and as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations: The operational test for a modified crane/derrick can be tailored to test only those portions of the equipment that were modified, only if the periodic load and operational test interval has not expired. After a boom change on a crane/derrick used for critical lifts, the operational test does not have to include verification of each brake (paragraph 5.3.3.f) if it has been less than a year since the brakes were tested with a load equal to or greater than the maximum capacity of the crane/derrick with the new boom. (Requirement 40830)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.4(1)	40831	Testing: Test Reports and Periodic Recertification Tags: After each test, designated personnel shall prepare written, dated, and signed test reports including procedure reference. (Requirement 40831)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.4(2)	40832	Testing: Test Reports and Periodic Recertification Tags: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 40832)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.4(3)	40833	Testing: Test Reports and Periodic Recertification Tags: These reports shall be kept on file by the owner organization for a minimum of two test cycles and shall be made readily available. (Requirement 40833)	S	I	I	Mgmt			
NASA STD 8719.9	05.3.4(4)	40834	Testing: Test Reports and Periodic Recertification Tags: Following the periodic load test, mobile cranes/derricks shall be given a permanently affixed tag, posted on the crane/derrick or an appropriate location, identifying the equipment and stating the next required periodic load test date or load test expiration date. (Requirement 40834)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.1(1)	40836	Inspection: Inspections, as described below, shall be performed on all mobile cranes/derricks and accessories. (Requirement 40836)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.1(2)	40837	Inspection: Inspections shall be performed according to this section, the manufacturers' recommendations, and ASME B30.5. (Requirement 40837)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.1(3)	40838	Inspection: Inadequacies discovered during an inspection shall be documented and, if determined to be a hazard, tagged out and corrected prior to further use. (Requirement 40838)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.1(4)	40839	Inspection: Inspections shall be performed by qualified personnel according to approved technical operating procedures. (Requirement 40839)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.2	40840	Inspection: All new, extensively repaired, or modified mobile cranes and derricks shall be given a daily and a periodic inspection prior to first use. For component repair on cranes/derricks, only the inspections that apply to the repaired portion need to be performed prior to first use unless a periodic inspection interval expires during the downtime (see paragraph 5.4.5). (Requirement 40840)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.3	40841	Inspection: Mobile cranes and derricks in regular service (used at least once a month) shall be inspected as required in paragraphs 5.4.4 and 5.4.5. Idle and standby cranes shall be inspected according to paragraph 5.4.6. (Requirement 40841)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.4	40842	Inspection: Daily Inspections. These inspections shall be performed and documented prior to first use each day the crane/derrick is used, and shall include the following: (Requirement 40842)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.4.a	40843	Inspection: Daily Inspections. These inspections shall be performed and documented prior to first use each day the crane/derrick is used, and shall include the following: Check operating and control mechanisms for proper function. (Requirement 40843)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.4.b	40844	Inspection: Daily Inspections. These inspections shall be performed and documented prior to first use each day the crane/derrick is used, and shall include the following: Without disassembling, visually inspect lines, tanks, valves, drain pumps, gear casings, and other components of fluid systems for deterioration and leaks. This applies to components that can be seen from the ground level or for which there is safe access via inspection walkways. (Requirement 40844)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.4.c	40845	Inspection: Daily Inspections. These inspections shall be performed and documented prior to first use each day the crane/derrick is used, and shall include the following: Without disassembling, inspect all functional operating and control mechanisms, including brakes where visible, for excessive wear and contamination by excessive lubricants or foreign matter. (Requirement 40845)	S	I	I	Mgmt			

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NASA STD 8719.9	05.4.4.d	40846	Inspection: Daily Inspections. These inspections shall be performed and documented prior to first use each day the crane/derrick is used, and shall include the following: Inspect hooks for cracks and deformities (see Section 7). (Requirement 40846)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.4.e	40847	Inspection: Daily Inspections. These inspections shall be performed and documented prior to first use each day the crane/derrick is used, and shall include the following: Inspect rope reeving for proper travel and drum lay. (Requirement 40847)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.4.f	40848	Inspection: Daily Inspections. These inspections shall be performed and documented prior to first use each day the crane/derrick is used, and shall include the following: Inspect hoist chains for excessive wear or distortion. (Requirement 40848)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5	40849	Inspection: Formal Periodic Inspections. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality. (Requirement 40849)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.a.1	40851	Inspection: Formal Periodic Inspections: Monthly Inspections (Frequent Inspections). At least once per month: Perform daily inspection requirements described in paragraph 5.4.4. (Requirement 40851)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.a.2	40852	Inspection: Formal Periodic Inspections: Monthly Inspections (Frequent Inspections). At least once per month: Inspect for excessive wear in brake (hoist and boom) and clutch system parts, linings, pawls, and ratchets without major disassembly. (Requirement 40852)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.a.3	40853	Inspection: Formal Periodic Inspections: Monthly Inspections (Frequent Inspections). At least once per month: Perform a thorough inspection of all ropes paying particular attention to the signs of deterioration and damage outlined in paragraph 5.5.3. (Requirement 40853)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.a.4	40854	Inspection: Formal Periodic Inspections: Monthly Inspections (Frequent Inspections). At least once per month: Inspect for visible deformation or cracks in hooks (see Section 7). (Requirement 40854)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.b.01	40856	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Requirements for monthly inspections (frequent inspections) described in paragraph 5.4.5.a. (Requirement 40856)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.b.02	40857	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Deformed, cracked, or corroded members and welds and loose bolts or rivets in crane structure. Various methods of NDT such as ultrasonics, radiography, magnetic particle, liquid penetrant, etc., shall be used as needed. (Requirement 40857)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.b.03	40858	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Cracked or worn sheaves and drums. (Requirement 40858)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.b.04	40859	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Excessive wear or cracks in pins, bearings, shafts, gears, followers, and locking and clamping devices. Surface or volumetric NDT shall be used to validate the existence or absence of cracks indicated by this inspection. (Requirement 40859)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.b.05	40860	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Significant inadequacies in load, wind, boom, angle, and other indicators over full range. (Requirement 40860)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.b.06	40861	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Excessive wear in chain drive sprockets and stretch in the chain. (Requirement 40861)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.b.07	40862	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Abnormal performance in power plant(s) and compliance with applicable safety requirements, such as locations of guards on belts. (Requirement 40862)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.b.08	40863	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Evidence of a malfunction in travel, steering, braking, and locking devices. (Requirement 40863)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.b.09	40864	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Evidence of a malfunction in any safety device. (Requirement 40864)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.5.b.10	40865	Inspection: Formal Periodic Inspections: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Evidence of overheating. (Requirement 40865)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.6	40866	Inspection: Idle and Standby Cranes/Derricks. Idle and standby cranes/derricks shall be inspected prior to first use according to the requirements of paragraphs 5.4.4 and 5.4.5 unless these monthly and annual inspections were performed at required intervals and recorded during the idle/standby period. (Requirement 40866)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.7(1)	40867	Inspection: Inspection Reports: After each formal periodic inspection, qualified, authorized personnel shall prepare written, dated, and signed inspection reports. (Requirement 40867)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.7(2)	40868	Inspection: Inspection Reports: These reports shall include procedure reference and adequacy of the crane/crane components. (Requirement 40868)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.7(3)	40869	Inspection: Inspection Reports: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 40869)	S	I	I	Mgmt			
NASA STD 8719.9	05.4.7(4)	40870	Inspection: Inspection Reports: These reports shall be filed and made readily available by the organizational element responsible for inspection. (Requirement 40870)	S	I	I	Mgmt			
NASA STD 8719.9	05.5(1)	40871	Maintenance: A maintenance program based on manufacturers' recommendations, integrating proactive, reactive, preventive, and predictive maintenance shall be established to increase the probability the mobile crane/derrick will function in the required manner over its design life cycle with a minimum of maintenance. (Requirement 40871)	S	I	I	Mgmt			
NASA STD 8719.9	05.5(2)	40872	Maintenance: The program shall include procedures and a scheduling system for normal periodic maintenance items, adjustments, replacements, and repairs. (Requirement 40872)	S	I	I	Mgmt			

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NASA STD 8719.9	05.5(3)	40873	Maintenance: The program shall also ensure that records are kept and unsafe test and inspection discrepancies are documented and corrected. (Requirement 40873)	S	I	I	Mgmt			
NASA STD 8719.9	05.5(4)	40874	Maintenance: Any mobile crane or derrick found in an unsafe operating condition shall be tagged out and removed from service until repaired. (Requirement 40874)	S	I	I	Mgmt			
NASA STD 8719.9	05.5(5)	40875	Maintenance: All repairs shall be made by qualified personnel in accordance with the manufacturers' instructions. (Requirement 40875)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.1	40876	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: (Requirement 40876)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.1.a	40877	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: Move to an area where maintenance will not interfere with other operations. (Requirement 40877)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.1.b	40878	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: Cranes/derricks shall not be operated until all safety devices have been activated and tested/adjusted if involved in the maintenance action. (Requirement 40878)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.2	40879	Maintenance: Adjustments. Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all components function properly, paying particular attention to: (Requirement 40879)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.2.a	40880	Maintenance: Adjustments. Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all components function properly, paying particular attention to: Brakes. Appropriate precautions shall be taken by inspectors, repair personnel, and others who may be potentially exposed to airborne dust fibers from any asbestos friction materials present in braking mechanisms. (Requirement 40880)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.2.b	40881	Maintenance: Adjustments. Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all components function properly, paying particular attention to: Control system. (Requirement 40881)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.2.c	40882	Maintenance: Adjustments. Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all components function properly, paying particular attention to: Power plants. (Requirement 40882)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.2.d	40883	Maintenance: Adjustments. Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all components function properly, paying particular attention to: Critical operating mechanisms and safety devices. (Requirement 40883)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.2.e	40884	Maintenance: Adjustments. Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all components function properly, paying particular attention to: Operator mechanical and electrical controls. (Requirement 40884)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3	40885	Maintenance: Repairs/Replacements. Repairs/replacements shall be promptly provided for safe operation. (Requirement 40885)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.a	40886	Maintenance: Repairs/Replacements: For repair/replacement requirements for hooks with deformation or cracks, see Section 7. If repaired, hooks shall be proof load tested using the associated mobile crane/derrick minimum working radius proof load value. (Requirement 40886)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.b(1)	40887	Maintenance: Repairs/Replacements: Structural members that are cracked, bent, broken, excessively worn, or corroded shall be evaluated by the responsible engineering organization to determine if they should be repaired or replaced. Proper material and weld/repair procedures will be used according to ANSI/AWS D14.1 and manufacturer specifications. (Requirement 40887)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.b(2)	40888	Maintenance: Repairs/Replacements: Any structural repairs/replacements shall be performed with the proper approval/concurrences required by OSHA, the applicable ASME standards, and the manufacturers' requirements. Procedures will be conducted by properly qualified personnel. (Requirement 40888)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c	40889	Maintenance: Repairs/Replacements: The need to replace wire rope shall be determined by a certified or otherwise qualified person based on an evaluation of inspection results. Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): (Requirement 40889)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c.1	40890	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): In running ropes, six randomly distributed broken wires in one rope lay or three broken wires in one strand in one lay or one valley break. In rotation resistant ropes, two randomly distributed broken wires in thirty rope diameters. In standing ropes, more than two broken wires in one lay in sections beyond end connections or any broken wires at an end connection. (Requirement 40890)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c.2	40891	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Individual outside wires with wear of 1/3 the original diameter. (Requirement 40891)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c.3	40892	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Kinking, crushing, bird caging, or any other damage resulting in distortion. (Requirement 40892)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c.4	40893	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Evidence of heat damage. (Requirement 40893)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c.5	40894	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): End connectors that are cracked, deformed, or with evidence of rope pullout. (Requirement 40894)	S	I	I	Mgmt			

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NASA STD 8719.9	05.5.3.c.6	40895	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Corrosion (internal or external) that results in reduction of rope diameter, or at end connectors. (Requirement 40895)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c.7.a	40897	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: 1/64 inch (0.4 mm) for diameters of rope up to 5/16 inch (8.0 mm). (Requirement 40897)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c.7.b	40898	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: 1/32 inch (0.8 mm) for diameters 3/8 inch (9.5 mm) to 1/2 inch (13.0 mm). (Requirement 40898)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c.7.c	40899	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: 3/64 inch (1.2 mm) for diameters 9/16 inch (14.5 mm) through 3/4 inch (19.0 mm). (Requirement 40899)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c.7.d	40900	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: 1/16 inch (1.6 mm) for diameters 7/8 inch (22.0 mm) through 1-1/8 inches (29.0 mm). (Requirement 40900)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.c.7.e	40901	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): Reductions of nominal diameter (measured with a caliper or go/no-go gage) of more than: 3/32 inch (2.4 mm) for diameters greater than 1-1/8 inches (29.0 mm). (Requirement 40901)	S	I	I	Mgmt			
NASA STD 8719.9	05.5.3.d	40902	Maintenance: Repairs/Replacements: Any of the following signs of deterioration and damage are sufficient reasons for rejection of the rope (see Wire Rope Users Manual for additional information on wire rope inspections): If replaced, the new rope shall be proof load tested using the associated mobile crane/derrick minimum working radius proof load value. (Requirement 40902)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.1(1)	40904	Personnel Certification: Only certified (licensed) and trained operators shall be authorized to use/operate mobile cranes and derricks. (Requirement 40904)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.1(2)	40905	Personnel Certification: A training, examination, and licensing program shall be established or made available. (Requirement 40905)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.1(3)	40906	Personnel Certification: For those NASA installations that do not have a training program, all operators shall be trained and certified by a recognized certification organization that normally performs this function. The operator certification program will be reviewed at least annually to assure that the contents, training material, testing, and examination elements are up-to-date with current methods and techniques; and that any "lessons-learned" are adequately addressed. (Requirement 40906)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.1(4)	40907	Personnel Certification: Riggers (see Section 10) and personnel performing NDT (see paragraph 1.9) shall be certified in their discipline. (Requirement 40907)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.1(5)	40908	Personnel Certification: Training shall be provided to observers and flagmen. (Requirement 40908)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.1(6)	40909	Personnel Certification: All participants in the lifting operation shall have clearly defined roles and responsibilities. (Requirement 40909)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2	40910	Personnel Certification: Levels: Two levels of operator training and proficiency will be established. Operations where critical lifts are involved will require a more rigid operator certification program than those operations that involve more routine lifts that do not involve critical hardware or unique hazards. (Requirement 40910)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a	40911	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: (Requirement 40911)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.1.a	40913	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Training: Classroom training in safety, lifting equipment emergency procedures, general performance standards, requirements, pre-operational checks, and safety-related defects and symptoms (for initial certification and as needed). (Requirement 40913)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.1.b	40914	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Training: Hands-on training (for initial certification and as needed). (Requirement 40914)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.1.c	40915	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Training: An annual review of the items in paragraph 5.6.2.a(1) above. (This may be conducted informally by local supervisory personnel.) (Requirement 40915)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.2.a	40917	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Physical examination (criteria to be determined by the cognizant medical official and should comply with ASME B30.5). (Requirement 40917)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.2.b	40918	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Written examination. (Requirement 40918)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.2.c	40919	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Operational demonstration (for initial certification only). (Requirement 40919)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.2.d	40920	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Proficiency examination for recertification. (Requirement 40920)	S	I	I	Mgmt			

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NASA STD 8719.9	05.6.2.a.3.a (1)	40922	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing: An organizational element shall be designated to issue operator licenses. (Requirement 40922)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.3.a (2)	40923	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing: Provisions shall be made to revoke licenses for negligence, violations of safety requirements, or failure to meet medical standards. (Requirement 40923)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.3.a (3)	40924	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing: Provisions shall be made for periodic checks of operators to verify they have licenses in their possession. (Requirement 40924)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.3.a (4)	40925	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing: The licenses shall indicate the type of crane/derrick the holder is qualified to operate. Alternately, the organizational element may elect to maintain a master list of licensed operators instead of issuing individual licenses, providing copies of the list are readily available to assurance and supervisory personnel at the work site. (Requirement 40925)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.a.3.b	40926	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: Renewal of all licenses shall require demonstration of proficiency or approval of supervision that proficiency is adequate and current. Licenses or certifications will expire at least every 4 years. Renewal procedures will be established by each licensing organization but, as a minimum, will include items in paragraphs 5.6.2.a.(1) and 5.6.2.a.(2). (Requirement 40926)	S	I	I	Mgmt			
NASA STD 8719.9	05.6.2.b	40927	Personnel Certification: Levels: Critical Lifts. Besides the training, examination, licensing, and renewal requirements for noncritical lifts, operators that are being certified to perform critical lifts must be trained in the specific hazards and special procedures associated with the lift. Operators must also demonstrate proficiency and operating finesse with the crane/derrick using a test load for the initial certification or alternately be immediately supervised by a certified operator during the first initial lifting period. The licenses will indicate specific cranes/derrick for which the operator is certified. (Requirement 40927)	S	I	I	Mgmt			
NASA STD 8719.9	05.7(1)	40928	Operations: Cranes/derricks shall be operated according to this section, the manufacturers' recommendations, and ASME B30.5. (Requirement 40928)	S	I	I	Mgmt			
NASA STD 8719.9	05.7(2)	40929	Operations: The following practices shall be followed for crane/derrick operations: (Requirement 40929)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.a	40930	Operations: The following practices shall be followed for crane/derrick operations: The operator is responsible for being totally familiar with the information contained in the crane/derrick operating manual and load chart. The operator must understand the correct meaning of all notes and warnings and be able to calculate or determine the crane's/derrick's actual net capacity for every possible machine configuration. (Requirement 40930)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.aa(1)	40931	Operations: The following practices shall be followed for crane/derrick operations: Hands shall be free from encumbrances while personnel are using crane/derrick ladders. (Requirement 40931)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.aa(2)	40932	Operations: The following practices shall be followed for crane/derrick operations: Articles that are too large to be carried in pockets or belts shall be lifted and lowered by handline. (Requirement 40932)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ab(1)	40933	Operations: The following practices shall be followed for crane/derrick operations: Necessary clothing and personal belongings in cabs shall be stored so as not to interfere with access or operations. (Requirement 40933)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ab(2)	40934	Operations: The following practices shall be followed for crane/derrick operations: Tools, oil can, waste, extra fuses, and other necessary articles shall be stored properly and shall not be permitted to lie loose in the cab or on the crane. (Requirement 40934)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ab(3)	40935	Operations: The following practices shall be followed for crane/derrick operations: Operators shall be familiar with the operation and care of the fire extinguishers provided. (Requirement 40935)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ac(1)	40936	Operations: The following practices shall be followed for crane/derrick operations: Crane/derrick crew discipline shall be maintained at all times during an operation. (Requirement 40936)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ac(2)	40937	Operations: The following practices shall be followed for crane/derrick operations: There shall be no eating, drinking, or rowdiness during crane/derrick operation. (Requirement 40937)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ad(1)	40938	Operations: The following practices shall be followed for crane/derrick operations: Mobile cranes shall be level. (Requirement 40938)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ad(2)	40939	Operations: The following practices shall be followed for crane/derrick operations: When the load to be handled and the operating radius require the use of outriggers, or any time when outriggers are used, the outrigger beams shall be fully extended or deployed per load rating chart specifications. (Requirement 40939)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ad(3)	40940	Operations: The following practices shall be followed for crane/derrick operations: Additionally, the outriggers shall be set to remove the machine weight from wheels if required by the OEM per load rating chart. (Requirement 40940)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ad(4)	40941	Operations: The following practices shall be followed for crane/derrick operations: Blocking under outrigger beams is not permitted. (Requirement 40941)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ad(5)	40942	Operations: The following practices shall be followed for crane/derrick operations: Blocking under outrigger floats, when used, shall be strong enough to prevent crushing, bending, or shear failure and of sufficient thickness, width, and length as to completely support the float, transmit the load to the supporting surface, and prevent shifting or toppling under load. (Requirement 40942)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ae	40943	Operations: The following practices shall be followed for crane/derrick operations: On truck mounted cranes, loads shall not be lifted over the front area except as approved by the crane manufacturer. (Requirement 40943)	S	I	I	Mgmt			

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NASA STD 8719.9	05.7.af(1)	40944	Operations: The following practices shall be followed for crane/derrick operations: Outriggers shall be used when the load to be handled at a particular radius exceeds rated load without outriggers, as specified by the crane manufacturer's load chart. (Requirement 40944)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.af(2)	40945	Operations: The following practices shall be followed for crane/derrick operations: Floats, where used, shall be securely attached to the outriggers. (Requirement 40945)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ag	40946	Operations: The following practices shall be followed for crane/derrick operations: Neither the load nor the boom shall be lowered below the point where less than two full wraps of rope remain on the respective drums. (Requirement 40946)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ah(1)	40947	Operations: The following practices shall be followed for crane/derrick operations: For mobile cranes in transit, the following precautions shall be taken: boom shall be stowed/carried in line with direction of motion. (Requirement 40947)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ah(2)	40948	Operations: The following practices shall be followed for crane/derrick operations: For mobile cranes in transit, the following precautions shall be taken: superstructure shall be secured against rotation, except in negotiating turns when there is an operator in the cab or boom is supported on a dolly. (Requirement 40948)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ah(3)	40949	Operations: The following practices shall be followed for crane/derrick operations: For mobile cranes in transit, the following precautions shall be taken: and hook shall be lashed or otherwise restrained so that it cannot swing freely while in transit or moving. (Requirement 40949)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ai	40950	Operations: The following practices shall be followed for crane/derrick operations: When traveling a mobile crane with a load, a person shall be designated responsible for determining and controlling safety and making decisions as to position of load, boom location, ground support, travel route, and speed of movement. (Requirement 40950)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.aj	40951	Operations: The following practices shall be followed for crane/derrick operations: A mobile crane with or without a load shall not be traveled with the boom so high that it may bounce back over the cab. (Requirement 40951)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ak(1)	40952	Operations: The following practices shall be followed for crane/derrick operations: When rotating cranes/derricks, sudden starts and stops shall be avoided. (Requirement 40952)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ak(2)	40953	Operations: The following practices shall be followed for crane/derrick operations: Speed shall be such that the load does not swing out beyond radii at which it can be controlled. (Requirement 40953)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ak(3)	40954	Operations: The following practices shall be followed for crane/derrick operations: A tag line shall be used when rotation of load is hazardous. (Requirement 40954)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.al	40955	Operations: The following practices shall be followed for crane/derrick operations: Ropes shall not be handled on a winch head without the knowledge of the operator. (Requirement 40955)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.am	40956	Operations: The following practices shall be followed for crane/derrick operations: While a winch head is being used, the operator shall be within convenient reach of the power unit control lever. (Requirement 40956)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.an	40957	Operations: The following practices shall be followed for crane/derrick operations: If the load must remain suspended for any considerable length of time, the operator shall hold the drum from rotating in the lowering direction by activating the positive control lever of the operator's station. (Requirement 40957)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ao(1)	40958	Operations: The following practices shall be followed for crane/derrick operations: Mobile cranes shall not be operated without the full amount of ballast or counterweight in place as specified by the manufacturer. (Requirement 40958)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ao(2)	40959	Operations: The following practices shall be followed for crane/derrick operations: The ballast or counterweight, as specified by the manufacturer, shall not be exceeded. (Requirement 40959)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ap	40960	Operations: The following practices shall be followed for crane/derrick operations: Refueling with small portable containers shall be done with Underwriter's Laboratories or Factory Mutual Laboratories approved (or equivalent) safety type can equipped with an automatic closing cap and flame arrestor. (Requirement 40960)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.aq	40961	Operations: The following practices shall be followed for crane/derrick operations: Machines shall not be fueled with engines running. (Requirement 40961)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ar	40962	Operations: The following practices shall be followed for crane/derrick operations: A carbon dioxide, dry chemical, or equivalent fire extinguisher shall be kept in the cab or vicinity of the crane/derrick. (Requirement 40962)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.as	40963	Operations: The following practices shall be followed for crane/derrick operations: Except where the electrical distribution and transmission lines have been deenergized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the crane, have been erected to prevent physical contact with power lines, mobile cranes shall be operated in accordance with the following: (Requirement 40963)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.as.1	40964	Operations: The following practices shall be followed for crane/derrick operations: Except where the electrical distribution and transmission lines have been deenergized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the crane, have been erected to prevent physical contact with power lines, mobile cranes shall be operated in accordance with the following: For lines rated 50kV or below, minimum clearance between lines and any part of crane or load shall be 10 feet (3 m). (Requirement 40964)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.as.2	40965	Operations: The following practices shall be followed for crane/derrick operations: Except where the electrical distribution and transmission lines have been deenergized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the crane, have been erected to prevent physical contact with power lines, mobile cranes shall be operated in accordance with the following: For lines rated over 50kV, minimum clearance between lines and any part of crane or load shall be 10 feet (3 m) plus 0.4 inch (10 mm) for each 1kV over 50kV, or twice the length of the line insulator, but never less than 10 feet (3 m). (Requirement 40965)	S	I	I	Mgmt			

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NASA STD 8719.9	05.7.as.3	40966	Operations: The following practices shall be followed for crane/derrick operations: Except where the electrical distribution and transmission lines have been deenergized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the crane, have been erected to prevent physical contact with power lines, mobile cranes shall be operated in accordance with the following: The crane shall be positioned to preclude the boom or load from contacting or falling across the power line(s) in the even of crane failure. (Requirement 40966)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.as.4(1)	40967	Operations: The following practices shall be followed for crane/derrick operations: Except where the electrical distribution and transmission lines have been deenergized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the crane, have been erected to prevent physical contact with power lines, mobile cranes shall be operated in accordance with the following: In transit, with no load and boom lowered, the clearance between lines and any part of crane shall be a minimum of 4 feet (1.2 m), for lines rated 0.75kV or below. (Requirement 40967)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.as.4(2)	40968	Operations: The following practices shall be followed for crane/derrick operations: Except where the electrical distribution and transmission lines have been deenergized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the crane, have been erected to prevent physical contact with power lines, mobile cranes shall be operated in accordance with the following: For lines rated over 0.75kV, the clearance shall be 4 feet (1.2 m) plus 0.17 inch (4.3 mm) for each 1kV over 0.75kV. Refer to ASME B30.5 for more details. (Requirement 40968)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.as.5	40969	Operations: The following practices shall be followed for crane/derrick operations: Except where the electrical distribution and transmission lines have been deenergized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the crane, have been erected to prevent physical contact with power lines, mobile cranes shall be operated in accordance with the following: Clearance observers shall be provided with an acceptable means of giving a warning in time for operators to react to insufficient clearance. (Requirement 40969)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.as.6	40970	Operations: The following practices shall be followed for crane/derrick operations: Except where the electrical distribution and transmission lines have been deenergized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the crane, have been erected to prevent physical contact with power lines, mobile cranes shall be operated in accordance with the following: Crane boom tips shall have two red flags, minimum of 12 inches (30.5 cm) x 12 inches (30.5 cm) each. (Requirement 40970)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.at(1)	40971	Operations: The following practices shall be followed for crane/derrick operations: Before starting operation near electrical lines, the organization responsible for the lines shall be notified and provided with all pertinent information. (Requirement 40971)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.at(2)	40972	Operations: The following practices shall be followed for crane/derrick operations: The responsible organization's cooperation shall be requested. (Requirement 40972)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.au	40973	Operations: The following practices shall be followed for crane/derrick operations: Any overhead wire shall be considered an energized line unless and until the person responsible for such line or the electrical utility authorities indicate that it is not an energized line. (Requirement 40973)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.av	40974	Operations: The following practices shall be followed for crane/derrick operations: Outdoor hoisting operations should not commence if winds are above 20 knots (23 mph, 37 km/hr) steady state or if gusts exceed 35 knots (40 mph, 65 km/hr). Consideration shall also be given to sail area and weather conditions such as lightning, or snow before commencing operations. (Requirement 40974)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.aw	40975	Operations: The following practices shall be followed for crane/derrick operations: Cranes/derricks left outdoors shall be secured by the operator when operations are complete. (Requirement 40975)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.ax	40976	Operations: The following practices shall be followed for crane/derrick operations: Wire rope should be used in accordance with the Wire Rope Users Manual. (Requirement 40976)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.b(1)	40977	Operations: The following practices shall be followed for crane/derrick operations: General operating procedures describing operation, emergency steps, communication requirements, and special requirements shall be prepared, approved, and followed for each crane/derrick. There must be a formal system for review, approval, and update to maintain valid operating procedures. (Requirement 40977)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.b(2)	40978	Operations: The following practices shall be followed for crane/derrick operations: Emergency procedures shall be developed for contingency actions such as power loss, brake failure, or other emergencies (also, see paragraph 1.5.1.c). (Requirement 40978)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.c(1)	40979	Operations: The following practices shall be followed for crane/derrick operations: Operations shall be analyzed for hazards. (Requirement 40979)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.c(2)	40980	Operations: The following practices shall be followed for crane/derrick operations: The analysis shall consider the environment in which the operation occurs, hazards associated with crane/derrick maintenance, and, in general, a safety analysis of the equipment, facility, load, human factors, and interfaces as a whole in support of the lifting operation. (Requirement 40980)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.d(1)	40981	Operations: The following practices shall be followed for crane/derrick operations: Appropriate load charts shall be located in the crane/derrick cab, if so equipped. (Requirement 40981)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.d(2)	40982	Operations: The following practices shall be followed for crane/derrick operations: Otherwise, the load charts shall be kept in a central, easily accessible place. (Requirement 40982)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.d(3)	40983	Operations: The following practices shall be followed for crane/derrick operations: Mobile cranes and derricks shall not be operated without an appropriate load chart. (Requirement 40983)	S	I	I	Mgmt			



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NASA STD 8719.9	05.7.e	40984	Operations: The following practices shall be followed for crane/derrick operations: For critical lifts, the load shall not exceed 75 percent of the crane's/derrick's rated capacity. (Requirement 40984)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.f	40985	Operations: The following practices shall be followed for crane/derrick operations: Methods shall be developed and demonstrated for lowering a load in the event of crane/derrick failure or other contingencies. These should be demonstrated and verified if practical. (Requirement 40985)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.g	40986	Operations: The following practices shall be followed for crane/derrick operations: A crane/derrick shall not be loaded beyond its rated load (capacity) except for required testing. (Requirement 40986)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.h(1)	40987	Operations: The following practices shall be followed for crane/derrick operations: Cranes/derricks shall not be used to load test items such as slings, platforms, or lifting fixtures unless specifically identified to do so based on a specified percentage of rated load, and a safety analysis approved by the LDEM and the responsible safety, engineering, operations, and maintenance organizations. (Requirement 40987)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.h(2)	40988	Operations: The following practices shall be followed for crane/derrick operations: Test procedures shall be approved by the responsible safety, engineering, operations, and maintenance organizations. This is to ensure that the crane/derrick is not damaged due to sudden unloading should the test article fail. Appendix D, crane/hoist requirements to load test other lifting equipment, shall be followed. (Requirement 40988)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.i(1)	40989	Operations: The following practices shall be followed for crane/derrick operations: Cranes/derricks shall not be side loaded, used to drag loads sideways, or used to pull loads unless specifically designed to do so by the OEM as indicated in the load chart. (Requirement 40989)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.i(2)	40990	Operations: The following practices shall be followed for crane/derrick operations: Side loading of the boom shall be limited to freely suspended loads. (Requirement 40990)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.j(1)	40991	Operations: The following practices shall be followed for crane/derrick operations: There shall be a system for documenting crane/derrick problems/discrepancies. (Requirement 40991)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.j(2)	40992	Operations: The following practices shall be followed for crane/derrick operations: Prior to an operation, the operator shall review any previously noted problems/discrepancies to determine possible impact on planned activity. (Requirement 40992)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.k(1)	40993	Operations: The following practices shall be followed for crane/derrick operations: The operator shall ensure that the crane/derrick is within inspection and testing intervals by examination of the periodic recertification tags and/or documentation. (Requirement 40993)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.k(2)	40994	Operations: The following practices shall be followed for crane/derrick operations: The operator shall adhere to all tags placed on the crane controls. (Requirement 40994)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.L(1)	40995	Operations: The following practices shall be followed for crane/derrick operations: Before each lift or series of lifts, the operator shall perform a pre-operational check to demonstrate operational readiness. If controls do not operate properly, the operator is responsible for notifying the supervisor. (Requirement 40995)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.L(2)	40996	Operations: The following practices shall be followed for crane/derrick operations: Repairs and adjustments shall be made before operations begin. (Requirement 40996)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.m	40997	Operations: The following practices shall be followed for crane/derrick operations: The operator and ground lead man shall establish appropriate safety zones before initiating operations. Safety zones should have appropriate barriers (rope, cones, or other) established prior to lift. (Requirement 40997)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.n	40998	Operations: The following practices shall be followed for crane/derrick operations: Before starting to hoist, the following conditions shall be noted: the hoist rope shall not be kinked, multiple part ropes shall not be twisted around each other, and the hook shall be centered over the load to prevent swinging. (Requirement 40998)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.o(1)	40999	Operations: The following practices shall be followed for crane/derrick operations: The operator shall know the weight of the working load. (Requirement 40999)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.o(2)	41000	Operations: The following practices shall be followed for crane/derrick operations: When raising loads that approach 75% of the rated capacity of the crane, the operator shall test the holding brakes. (Requirement 41000)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.o(3)	41001	Operations: The following practices shall be followed for crane/derrick operations: The brakes shall be tested by raising the load minimally above the surface and holding the load with the brake. The load should be held long enough to allow any dynamics to dampen out. (Requirement 41001)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.p(1)	41002	Operations: The following practices shall be followed for crane/derrick operations: If radio communications are to be used, operators and/or lift supervisors shall test the communication system prior to each operation. (Requirement 41002)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.p(2)	41003	Operations: The following practices shall be followed for crane/derrick operations: Operations shall stop immediately upon communication loss and shall not continue until communication is restored. (Requirement 41003)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.q(1)	41004	Operations: The following practices shall be followed for crane/derrick operations: If hand signals are required, only standard signals shall be used according to Appendix B. (Requirement 41004)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.q(2)	41005	Operations: The following practices shall be followed for crane/derrick operations: Hand signals shall be posted in a conspicuous location. (Requirement 41005)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.s	41007	Operations: The following practices shall be followed for crane/derrick operations: If there is a slack rope condition, it shall be determined that the rope is properly seated on the drum and in the sheaves before starting the hoist. (Requirement 41007)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.t	41008	Operations: The following practices shall be followed for crane/derrick operations: During hoisting, care shall be taken that there is no sudden acceleration or deceleration of the moving load and that the load does not contact any obstructions. (Requirement 41008)	S	I	I	Mgmt			

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NASA STD 8719.9	05.7.u(1)	41009	Operations: The following practices shall be followed for crane/derrick operations: Load shall be secured, balanced, and kept under control with proper slings. The use of tag lines to keep the load stabilized may be required. (Requirement 41009)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.u(2)	41010	Operations: The following practices shall be followed for crane/derrick operations: Tag line personnel shall take care not to impart undesirable motion to the load. (Requirement 41010)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.v(1)	41011	Operations: The following practices shall be followed for crane/derrick operations: Person(s) shall not ride the hook or load at anytime. (Requirement 41011)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.v(2)	41012	Operations: The following practices shall be followed for crane/derrick operations: If conventional means of reaching a worksite such as an aerial platform, ladder, stairs, or scaffold, would be more hazardous or not possible because of structural design or worksite conditions, 29 CFR 1926.550 and ASME B30.23 shall be followed for lifting of personnel with a crane, which is considered a critical lift (see Appendix C). (Requirement 41012)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.w	41013	Operations: The following practices shall be followed for crane/derrick operations: Personnel shall not be located under suspended or moving loads unless the operation adheres to the OSHA-approved NASA Alternate Standard for Suspended Load Operations (see Appendix A). (Requirement 41013)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.x	41014	Operations: The following practices shall be followed for crane/derrick operations: The load shall not be lowered below the point where less than two full wraps of rope remain on the host drum. (Requirement 41014)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.y	41015	Operations: The following practices shall be followed for crane/derrick operations: A responsible person shall be in charge of the operation and shall instruct all personnel involved in the proper positioning, rigging, and moving to be done. (Requirement 41015)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.z(1)	41016	Operations: The following practices shall be followed for crane/derrick operations: An operator shall be at the crane/derrick controls at all times while a load is suspended (OSHA requirement). (Requirement 41016)	S	I	I	Mgmt			
NASA STD 8719.9	05.7.z(2)	41017	Operations: The following practices shall be followed for crane/derrick operations: Due to the length of some NASA operations, an operator change may be required while a load is suspended. This shall be accomplished via a procedure designed for the specific crane/derrick and operation, ensuring that the crane controls are manned at all times. (Requirement 41017)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1	41019	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives of EED's. (Requirement 41019)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.a(1)	41020	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): DOT-packaged explosives shall be handled in accordance with approved hazardous operating procedures. (Requirement 41020)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.a(2)	41021	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): Barricades and warning signs shall be erected to control access. (Requirement 41021)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.b(1)	41022	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): Explosives and EED's that are not within DOT-approved containers shall be handled in accordance with approved hazardous operations procedures. (Requirement 41022)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.b(2)	41023	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): In addition to system configuration controls, these procedures shall ensure the following requirements are met: (Requirement 41023)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.b.1(1)	41024	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): In addition to system configuration controls, these procedures shall ensure the following requirements are met: Voltage checks on crane hooks that will handle explosives or EED's shall be performed prior to the start of operations; (Requirement 41024)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.b.1(2)	41025	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): In addition to system configuration controls, these procedures shall ensure the following requirements are met: all crane motions shall be checked. (Requirement 41025)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.b.2(1)	41026	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): In addition to system configuration controls, these procedures shall ensure the following requirements are met: For static sensitive systems, the crane hook shall be connected to facility ground before connecting to explosives or EED's. (Requirement 41026)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.b.2(2)	41027	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): In addition to system configuration controls, these procedures shall ensure the following requirements are met: Electrical grounding of the hook and load shall be accomplished prior to lifting operations. If a ground connection must be disconnected to facilitate operations, an alternate ground should be connected prior to disconnecting the existing ground. The final attachment/detachment must be at least 10 feet from exposed propellant grain, explosives or EED's. (Requirement 41027)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.b.3	41028	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): In addition to system configuration controls, these procedures shall ensure the following requirements are met: The danger potential for radio transmissions near explosives shall be evaluated prior to the operation. (Requirement 41028)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.b.4	41029	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): In addition to system configuration controls, these procedures shall ensure the following requirements are met: Personnel limits, protective clothing, warning signs and barricades shall be used as required. (Requirement 41029)	S	I	I	Mgmt			
NASA STD 8719.9	05.8.1.b.5	41030	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's): In addition to system configuration controls, these procedures shall ensure the following requirements are met: Safety surveillance requirements shall be followed. (Requirement 41030)	S	I	I	Mgmt			

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NASA STD 8719.9	05.8.2	41031	Special Criteria: Policy shall be developed and enforced for crane/derrick operation during electrical storms. Operations are generally permitted without restriction within enclosed metal or framed buildings that are properly grounded. Restrictions are necessary for outside operations or for those that cannot tolerate power failure/loss. (Requirement 41031)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.2.a	41037	Safety and Design Aspects: Labeling/Tagging of Hoists and Winches: The hoist's or winch's rated capacity shall be marked on it or its load block. This marking shall be clearly legible from the ground floor. (Requirement 41037)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.2.b	41038	Safety and Design Aspects: Labeling/Tagging of Hoists and Winches: Hoists and winches that have the specified design features, maintenance/inspection, and test intervals to lift critical loads shall be marked conspicuously so that the operator and assurance personnel can distinguish that the hoist or winch is qualified for critical lifts. (Requirement 41038)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.2.c	41039	Safety and Design Aspects: Labeling/Tagging of Hoists and Winches: A standard system of labeling shall be established and used throughout the installation. (Requirement 41039)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.2.d	41040	Safety and Design Aspects: Labeling/Tagging of Hoists and Winches: A standard lockout/tagout system shall be established and used throughout the installation to indicate equipment that is not to be used due to inspection discrepancies, ongoing maintenance operations, or other reason. (Requirement 41040)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.2.e	41041	Safety and Design Aspects: Labeling/Tagging of Hoists and Winches: Certification/recertification tags are required as described in paragraph 6.3.4. (Requirement 41041)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.3(1)	41042	Safety and Design Aspects: Safety Analysis and Documentation for Hoists and Winches used for Critical Lifts: A recognized safety hazard analysis such as fault tree analysis, FMEA, O&SHA shall be performed on all hoists and winches used for critical lifts. (Requirement 41042)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.3(2)	41043	Safety and Design Aspects: Safety Analysis and Documentation for Hoists and Winches used for Critical Lifts: The analysis shall, as a minimum, determine potential sources of danger, identify failure modes, and recommend resolutions and a system of risk acceptance for those conditions found in the hardware-facility-environment-human relationship that could cause loss of life, personal injury, and loss of or damage to the hoist, winch, facility, or load. (Requirement 41043)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.3(3)	41044	Safety and Design Aspects: Safety Analysis and Documentation for Hoists and Winches used for Critical Lifts: The analysis shall be done as part of the initial evaluation process for critical lift compliance and prior to use in a critical lift, included in the hoist or winch documentation, and updated as required to reflect any changes in operation and/or configuration. (Requirement 41044)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.4(1)	41045	Safety and Design Aspects: Performance: Duty cycle, load capability, and the desired control characteristics with which the hoist or winch handles the load shall be addressed for all designs. (Requirement 41045)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.4(2)	41046	Safety and Design Aspects: Performance: Duty cycle requirements shall be based on the worst expected duty the unit will encounter. (Requirement 41046)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.4(3)	41047	Safety and Design Aspects: Performance: Operational requirements shall be considered in the design phase to ensure load and function are adequately defined and critical hoist design features are incorporated on the delivered units. Environmental conditions must also be considered. (Requirement 41047)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.5	41048	Safety and Design Aspects: Structural: Structural design shall be in accordance with industry standards for material selection, welding, allowable stresses, design limitations, framing, wheels, and other structural elements. Refer to CMAA standards for specific design details. (Requirement 41048)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.03(1)	41054	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: For powered (electric and air) hoists and winches used for critical lifts, two holding brakes shall be provided, each capable of bringing a rated load to zero speed and holding it. (Requirement 41054)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.03(2)	41055	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: Holding brakes shall be applied automatically when power to the brake is removed. If the control brake and holding brake are designed to operate as a system and cannot independently stop and hold a rated load, then another means of braking is required (e.g., emergency brake). (Requirement 41055)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.03(3)	41056	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: The brakes shall be designed so that they can be tested as required in paragraph 6.3.3.e. (Requirement 41056)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.03(4)	41057	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: The brake design shall provide for emergency load lowering. (Requirement 41057)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.04	41058	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: For critical lift application, speed reduction from the motor to the drum on the hoist should be achieved by enclosure in a gear case. If open gears are required, they shall be guarded with a provision for lubrication and inspection. (Requirement 41058)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.05(1)	41059	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: All wire rope hoists and winches shall have not less than two wraps of hoisting rope on the drum when the hook is in its extreme low position. (Requirement 41059)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.05(2)	41060	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: Drum grooves, when provided, shall be as recommended by CMAA. (Requirement 41060)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.05(3)	41061	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: The rope ends shall be anchored securely by a clamp or a swaged terminal in a keyhole slot, provided a keeper is used to prohibit the swage from moving out of the narrow slot. Other methods recommended by the hoist or wire rope manufacturer are acceptable if the rope termination anchor together with two wraps of rope on the drum will give an anchor system equal to or greater than the breaking strength of the wire rope. (Requirement 41061)	S	I	I	Mgmt			

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NASA STD 8719.9	06.2.6.b.06(1)	41062	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: Safe and adequate access to hoist and winch components to inspect, service, repair, or replace equipment shall be provided for during design. (Requirement 41062)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.06(2)	41063	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: The design shall provide for visual and physical accessibility. (Requirement 41063)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.07(1)	41064	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: Manually operated (nonpowered), off-the-shelf OEM type hoists and winches are acceptable for critical and noncritical lift applications. They shall comply with applicable ASME requirements. (Requirement 41064)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.07(2)	41065	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: These hoists shall be equipped with at least one self-setting brake, referred to as a holding brake, applied directly to the motor shaft or some part of the gear train. No limit switches are required if proper over-travel restraint is provided. (Requirement 41065)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.08	41066	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: Air operated chain hoists and winches can be equipped with over-travel protection devices instead of the hoist travel limit switches.	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.09(1)	41067	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: Initial and final upper limit switches (limit control valves) shall be provided and tested for air-operated hoists and winches as described in paragraph 6.2.7.i. (Requirement 41067)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.09(2)	41068	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: The final upper limit switch (limit control valve) shall exhaust air from the hoist or winch, set the brakes, and require reset at the upper limit switch (limit control valve) level. (Requirement 41068)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.10(1)	41069	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: Worm gears shall not be used as a holding brake unless the lead angle is sufficient to prevent back driving. Worm gears used as a brake for air and electric powered hoists may be considered as a second holding brake. (Requirement 41069)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.10(2)	41070	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: The braking properties of a worm gear tend to degrade with use; the design engineer shall consider this when purchasing new equipment or in existing installations where the hoist is subject to heavy use.	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.11(1)	41071	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: In the procurement of new lifting equipment, the use of cast iron components in the hoist or winch load path shall be approved, as a minimum, by the LDEM and the responsible design engineering organization. (Requirement 41071)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.11(2)	41072	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: The material properties of cast iron allow catastrophic failure and should not be considered as reliable as steel or cast steel. The engineer shall consider this when selecting equipment and avoid the use of load bearing cast iron materials where possible.	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.12	41073	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: Gearing shall be designed and manufactured to comply with the latest AGMA gear standards. (Requirement 41073)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.b.13	41074	Safety and Design Aspects: Mechanical: The mechanical design requirements for hoist and winch components are as follows: Each load-bearing component shall be specified or detailed to lift the maximum imposed loads resulting from zero to rated hook load with appropriate design factors.	S	I	I	Mgmt			
NASA STD 8719.9	06.2.6.c	41075	Safety and Design Aspects: Mechanical: When the use of high quality, off-the-shelf, OEM type equipment is not possible due to unique design and operation requirements, then built-up type equipment must be used. These built-up hoists/winches generally use many commercially available or made-to-order motors, brakes, couplings, gear reducers, etc. These components are then custom engineered together as an assembly mounted on custom designed and built equipment frames. In many cases, gear reducers, drums, and drive shafts are custom designed and built. Structural and mechanical parts, such as sheave pins, hook-block components, bridge girders, and bridge and trolley drives are also custom designed and built as components or assemblies. The built-up type crane should only be used where commercial equipment is not available to meet the user/operational requirements described in this paragraph. Due to the nature of its one of a kind design and construction, this type of equipment is generally more prone to break down and should be considered as less reliable than commercial equipment. These units shall meet the mechanical	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.a	41077	Electrical: Electrical Design Requirements are as follows: The use of high quality, off-the-shelf, OEM type equipment is acceptable for critical and noncritical lift applications if it meets all user requirements and the requirements of this document.	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.b	41078	Electrical: Electrical Design Requirements are as follows: When the use of high quality, off-the-shelf, OEM type equipment is not possible due to unique design and operation requirements, then built-up type equipment must be used. This built-up equipment generally uses many commercially available or made-to-order components which are then custom engineered together as an assembly. Built-up equipment should only be used where commercial equipment is not available to meet the user/operational requirements. Due to the nature of its one of a kind design and construction, this type of equipment is generally more prone to break down and should be considered less reliable than commercial equipment.	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.c	41079	Electrical: Electrical Design Requirements are as follows: Wiring and safety devices shall be in accordance with the NFPA National Electrical Code. (Requirement 41079)	S	I	I	Mgmt			

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NASA STD 8719.9	06.2.7.d	41080	Electrical: Electrical Design Requirements are as follows: Electrical enclosures shall provide protection for the contained equipment against environmental conditions as required by NEMA. (Requirement 41080)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.e	41081	Electrical: Electrical Design Requirements are as follows: In addition to overload protection required by the National Electrical Code, undervoltage and phase reversal should be considered. (Requirement 41081)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.f(1)	41082	Electrical: Electrical Design Requirements are as follows: For powered hoists and winches used for critical lifts, an assessment shall be performed to determine the operational needs for remote emergency stops independent from the operator controlled emergency stop. Not all hoists and winches used for critical lifts require a remote emergency stop. Remote emergency stops are required for hoists and winches used for critical lifts where the operator's view is restricted/obstructed. When provided, this independent remote emergency stop should be located such that the independent remote emergency stop operator(s) can clearly see the critical lift area(s). (Requirement 41082)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.f(2)	41083	Electrical: Electrical Design Requirements are as follows: The remote emergency stop circuit shall be separate from and take precedence over the operator control circuit. (Requirement 41083)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.f(3)	41084	Electrical: Electrical Design Requirements are as follows: The control, when activated, shall cause all drives to stop and the brakes to set. Hand-held remote emergency stop pendants should be standardized and should include power and circuit continuity indication. For those hoists and winches required to make critical lifts that have not been modified to provide a remote emergency stop, handling procedures shall be developed and implemented to minimize the risk. (Requirement 41084)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.g(1)	41085	Electrical: Electrical Design Requirements are as follows: Electrical control stations shall operate on 150 volts DC, 120 volts AC, or less. (Requirement 41085)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.g(2)	41086	Electrical: Electrical Design Requirements are as follows: Positive detent pushbuttons or a control lever shall be used for speed control. (Requirement 41086)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.g(3)	41087	Electrical: Electrical Design Requirements are as follows: Controls shall return to the off position when the operator relieves pressure. (Requirement 41087)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.g(4)	41088	Electrical: Electrical Design Requirements are as follows: A red, emergency stop pushbutton shall be provided to operate the mainline contactor, main circuit breaker, or pneumatic source (main breaker preferred). A dump valve is acceptable for the emergency stop for a pneumatic hoist. (Requirement 41088)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.h	41089	Electrical: Electrical Design Requirements are as follows: The electrical system shall be designed fail-safe to ensure that a failure of any component will not cause the hoist or winch to operate in a speed range faster than commanded. A failure that causes a speed different from that selected is acceptable provided no hazards are introduced. Failure modes that cause the hoist or winch to slow down or come to a safe stop are acceptable; those that could cause unplanned directional shifts, and/or loss of control are unacceptable. (Requirement 41089)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.i	41090	Electrical: Electrical Design Requirements are as follows: For hoists and winches used for critical lifts (except manual), dual upper limit switches are required. For electric hoists and winches, the limit switches shall meet the following requirements:	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.i.1	41091	Electrical: Electrical Design Requirements are as follows: For hoists and winches used for critical lifts (except manual), dual upper limit switches are required. For electric hoists and winches, the limit switches shall meet the following requirements: Initial upper limit switch electrical contacts shall be a set of normally closed contacts in the "raise" contactor circuit such that movement in the raise direction shall be precluded after the limit switch is encountered. Movement in the "lower" direction will not be inhibited. (Requirement 41091)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.i.2	41092	Electrical: Electrical Design Requirements are as follows: For hoists and winches used for critical lifts (except manual), dual upper limit switches are required. For electric hoists and winches, the limit switches shall meet the following requirements: Final upper limit switch electrical contacts shall be a set of normally closed electrical contacts wired into the mainline circuit, hoist or winch power circuit, main contactor control circuit, or hoist/winch power contactor control circuit such that all hoist or winch motion shall be precluded after the limit switch is encountered. These normally closed contacts may be located in the low voltage circuitry. (Requirement 41092)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.i.3	41093	Electrical: Electrical Design Requirements are as follows: For hoists and winches used for critical lifts (except manual), dual upper limit switches are required. For electric hoists and winches, the limit switches shall meet the following requirements: After a final upper limit switch has been activated, movement of the load will require action (resetting) at the final upper limit switch level. An inspection shall be made to determine the cause of failure of the initial upper limit switch. Stopping hoist motion by the above design configuration may result in a hazardous suspended load condition. The hoist design should include a means of detecting limit switch failure and allow for safe inspection and repair. For example, a system may be equipped with two different colored annunciator lights, one for each limit switch. A reset button may be included so that when a final upper limit switch is tripped, the load can be lowered immediately. The reset button should be secured to prevent unauthorized use. (Requirement 41093)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.i.4(1)	41094	Electrical: Electrical Design Requirements are as follows: For hoists and winches used for critical lifts (except manual), dual upper limit switches are required. For electric hoists and winches, the limit switches shall meet the following requirements: The initial upper limit switch shall be adjusted sufficiently low to preclude inadvertent actuation of the final upper limit switch if the hoist actuates the initial switch at full speed with no load. (Requirement 41094)	S	I	I	Mgmt			

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NASA STD 8719.9	06.2.7.i.4(2)	41095	Electrical: Electrical Design Requirements are as follows: For hoists and winches used for critical lifts (except manual), dual upper limit switches are required. For electric hoists and winches, the limit switches shall meet the following requirements: Similarly, the final upper limit shall be adjusted sufficiently low to ensure that the hoist or winch will not two-block (or otherwise damage wire rope) if the hoist or winch actuates the final switch at full speed with no load. (Requirement 41095)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.i.4(3)	41096	Electrical: Electrical Design Requirements are as follows: For hoists and winches used for critical lifts (except manual), dual upper limit switches are required. For electric hoists and winches, the limit switches shall meet the following requirements: Both limits shall be tested from slow speed to full speed to verify correct operation. It should be noted that this requirement effectively lowers the usable hook height of the hoist. The limit switch arrangement needs to be considered during new equipment design. (Requirement 41096)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.j	41097	Electrical: Electrical Design Requirements are as follows: Provisions for grounding the hook are required for handling explosives, solid propellants, flammables, or any other load that requires a nonelectrical or static-free environment. See paragraph 6.8 for handling explosives or EED's.	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.k	41098	Electrical: Electrical Design Requirements are as follows: For hoists and winches used for critical lifts, lower limit switches to prevent reverse winding of the wire rope shall be provided.	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.L	41099	Electrical: Electrical Design Requirements are as follows: Electrical hoists and winches shall have the capability to be locked out at the main breaker to prevent unauthorized use. (Requirement 41099)	S	I	I	Mgmt			
NASA STD 8719.9	06.2.7.m	41100	Electrical: Electrical Design Requirements are as follows: Hoists and winches shall be designed fail-safe in the event of a power outage. (Requirement 41100)	S	I	I	Mgmt			
NASA STD 8719.9	06.3(1)	41101	Testing: Three types of tests are required on hoists: proof load tests, periodic load tests, and operational tests. The proof load tests and operational tests shall be performed prior to first use for new, extensively repaired, or altered hoists and winches. (Requirement 41101)	S	I	I	Mgmt			
NASA STD 8719.9	06.3(2)	41102	Testing: The periodic load and operational tests shall be performed at least every 4 years. (Requirement 41102)	S	I	I	Mgmt			
NASA STD 8719.9	06.3(3)	41103	Testing: For hoists and winches used for critical lifts, these tests shall be based on frequency of usage. (Requirement 41103)	S	I	I	Mgmt			
NASA STD 8719.9	06.3(4)	41104	Testing: Hoists and winches used frequently for critical lifts shall be load tested annually. (Requirement 41104)	S	I	I	Mgmt			
NASA STD 8719.9	06.3(5)	41105	Testing: Hoists and winches used infrequently for critical lifts shall be load tested before each critical lift if it has been more than one year since the last test. (Requirement 41105)	S	I	I	Mgmt			
NASA STD 8719.9	06.3(6)	41106	Testing: If a hoist or winch is upgraded, a proof load test and an operational test shall be performed based on the upgraded rating. (Requirement 41106)	S	I	I	Mgmt			
NASA STD 8719.9	06.3(7)	41107	Testing: All load and operational tests shall be performed by qualified personnel according to written (specific or general) technical operating procedures. (Requirement 41107)	S	I	I	Mgmt			
NASA STD 8719.9	06.3(8)	41108	Testing: An inspection shall be performed after each load test and prior to the hoist being released for service to ensure there is no damage. (Requirement 41108)	S	I	I	Mgmt			
NASA STD 8719.9	06.3(9)	41109	Testing: Surface or volumetric NDT shall be used to validate the existence or absence of cracks or other load test effects indicated by this inspection. (Requirement 41109)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.1	41110	Testing: Proof Load Test. Before first use and after installation, all new, extensively repaired, modified, or altered hoists and winches shall undergo a proof load test with a dummy load as close as possible to, but not exceeding 125 percent of the rated load. The acceptable tolerance for proof load test accuracy is -5/+0 percent. (Requirement 41110)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.2(1)	41111	Testing: Periodic Load Test. All hoists and winches shall be tested at least once every 4 years with a dummy load equal to the hoist's/winches rated capacity. (Requirement 41111)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.2(2)	41112	Testing: Periodic Load Test: Platform hoists shall be tested using the attached platform only. (Requirement 41112)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.2(3)	41113	Testing: Periodic Load Test: Hoists and winches used for critical lifts shall be load tested at least once per year. (Requirement 41113)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.2(4)	41114	Testing: Periodic Load Test: Hoists and winches used infrequently for critical lifts shall be load tested before each critical lift if it has been over one year since the last test. The acceptable tolerance for periodic load test accuracy is +5/-0 percent. The periodic load test can be fulfilled by a concurrently performed proof load test. (Requirement 41114)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.3	41115	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified (platform hoists shall be operationally tested using the attached platform only): (Requirement 41115)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.3.c	41118	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified (platform hoists shall be operationally tested using the attached platform only): Determine trip setting of limit switches and limiting devices by tests under no load conditions. Conduct tests first by hand, if practical, and then under the slowest speed obtainable. Test with increasing speeds up to the maximum speed. Locate actuating mechanisms so that they will trip the switches or limiting devices in time to stop motion without damaging the hoist or winch.	S	I	I	Mgmt			

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NASA STD 8719.9	06.3.3.d	41119	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified (platform hoists shall be operationally tested using the attached platform only): After testing in the unloaded state, apply the test load to the hoist or winch to check the proper load control. Test load hoisting, lowering at various speeds (maximum safe movement up and down as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations), and braking/holding mechanisms. Holding brakes shall be tested to verify stopping capabilities and demonstrate the ability to hold a rated load (see paragraph 6.3.3.e). The load should be held long enough to allow any dynamics to dampen out.	S	I	I	Mgmt			
NASA STD 8719.9	06.3.3.e	41120	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified (platform hoists shall be operationally tested using the attached platform only): Powered hoists and winches used for critical lifts are required to be equipped with two holding brakes, each capable of bringing a rated load to zero speed and holding it (see paragraph 6.2.6.b(3)). If a worm gear is used as a holding brake, it shall be tested to ensure it is able to hold a static load and stop a dynamic load. The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways:	S	I	I	Mgmt			
NASA STD 8719.9	06.3.3.e.1	41121	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified (platform hoists shall be operationally tested using the attached platform only): The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Each brake's ability to hold shall be statically tested (under no load) with 150 percent of the rated load hoisting torque at the point of brake application. (Requirement 41121)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.3.e.2	41122	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified (platform hoists shall be operationally tested using the attached platform only): The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Alternately, each brake shall be tested for its ability to stop and hold a rated load in both the raising and lowering modes. (CAUTION: It must be possible to quickly reenergize the out of circuit brake or provide other safety measures to perform this test safely.) (Requirement 41122)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.3.e.3	41123	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified (platform hoists shall be operationally tested using the attached platform only): The operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Other methods may be used as approved by the LDEM with concurrence from the responsible safety, engineering, operations, and maintenance organizations.	S	I	I	Mgmt			
NASA STD 8719.9	06.3.3.f	41124	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified (platform hoists shall be operationally tested using the attached platform only): The operational test for a modified hoist or winch can be tailored to test only those portions of the equipment that were modified, only if the periodic load and operational test interval has not expired.	S	I	I	Mgmt			
NASA STD 8719.9	06.3.4(1)	41125	Testing: Test Reports and Periodic Recertification Tags. After each test, designated personnel shall prepare written, dated, and signed test reports, including procedure reference. (Requirement 41125)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.4(2)	41126	Testing: Test Reports and Periodic Recertification Tags: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41126)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.4(3)	41127	Testing: Test Reports and Periodic Recertification Tags: These reports shall be filed and shall be made readily available by the organization responsible for testing the hoist. (Requirement 41127)	S	I	I	Mgmt			
NASA STD 8719.9	06.3.4(4)	41128	Testing: Test Reports and Periodic Recertification Tags: Following the periodic load test, all hoists and winches shall be given a permanently affixed tag, posted on the hoist or winch or an appropriate location, identifying the equipment and stating the next required periodic load test date or load test expiration date. (Requirement 41128)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.1(1)	41130	Inspection: Inspections, as described below, shall be performed on all hoists and winches in regular service.	S	I	I	Mgmt			
NASA STD 8719.9	06.4.1(2)	41131	Inspection: Inspections shall be performed according to this section, the manufacturers' recommendations, and the applicable ASME standard.	S	I	I	Mgmt			
NASA STD 8719.9	06.4.1(3)	41132	Inspection: Inadequacies discovered during an inspection shall be documented and, if determined to be a hazard, tagged out and corrected prior to further use. (Requirement 41132)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.1(4)	41133	Inspection: Inspections shall be performed by qualified personnel according to approved technical operating procedures.	S	I	I	Mgmt			
NASA STD 8719.9	06.4.2	41134	Inspection: All new, extensively repaired, or modified hoists and winches shall be inspected to the requirements of both daily and periodic inspections prior to first use. For component repair on hoists and winches, only the inspections that apply to the repaired portion need to be performed prior to first use unless a periodic inspection interval expires during the downtime (see paragraph 6.4.5). (Requirement 41134)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.3(1)	41135	Inspection: Hoists and winches in regular service (used at least once per month) shall be inspected as required in paragraphs 6.4.4 and 6.4.5. (Requirement 41135)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.3(2)	41136	Inspection: Idle and standby hoists/winches shall be inspected according to paragraph 6.4.6. (Requirement 41136)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.4	41137	Inspection: Daily Inspections. These inspections shall be performed each day the hoist or winch is used and shall include the following: (Requirement 41137)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.5	41144	Inspection: Formal Periodic Inspections. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality. (Requirement 41144)	S	I	I	Mgmt			

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NASA STD 8719.9	06.4.5.a	41145	Inspection: Formal Periodic Inspections. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Monthly Inspections (Frequent Inspections). At least once per month: (Requirement 41145)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.5.a.2	41147	Inspection: Formal Periodic Inspections. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Monthly Inspections (Frequent Inspections). At least once per month: Inspect wire rope monthly (except those on platform systems that shall be inspected at least twice a year), paying particular attention to the following signs of deterioration and damage:	S	I	I	Mgmt			
NASA STD 8719.9	06.4.5.b	41170	Inspection: Formal Periodic Inspections. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Annual Inspections (Periodic Inspections). At least once per year: (Requirement 41170)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.5.b.2	41172	Inspection: Formal Periodic Inspections. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Annual Inspections (Periodic Inspections). At least once per year: Check for loose bolts and rivets and cracked or worn drums and sheaves. Various methods of NDT such as ultrasonics, radiography, magnetic particle, and liquid penetrant shall be used as needed.	S	I	I	Mgmt			
NASA STD 8719.9	06.4.5.b.3	41173	Inspection: Formal Periodic Inspections. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Annual Inspections (Periodic Inspections). At least once per year: Check for worn, corroded, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers, and locking and clamping devices. Surface or volumetric NDT shall be used to validate the existence or absence of cracks or toher load test effects indicated by this inspection.	S	I	I	Mgmt			
NASA STD 8719.9	06.4.5.b.6	41176	Inspection: Formal Periodic Inspections. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Annual Inspections (Periodic Inspections). At least once per year: Inspect hook-retaining nuts or collars, pins, welds, or rivets used to secure retaining members for deformations, cracks, or excessive corrosion. Surface or volumetric NDT shall be used to validate the existence or absence of cracks or other load test effects indicated by this inspection.	S	I	I	Mgmt			
NASA STD 8719.9	06.4.6	41179	Inspection: Idle and Standby Hoists/Winches. Idle and standby hoists/winches shall be inspected prior to first use according to the requirements of paragraphs 6.4.4 and 6.4.5 unless these daily and formal periodic inspections were performed at required intervals and recorded during the idle/standby period.	S	I	I	Mgmt			
NASA STD 8719.9	06.4.7(1)	41180	Inspection: Inspection Reports. After each formal periodic inspection, qualified, authorized personnel shall prepare written, dated, and signed inspection reports. (Requirement 41180)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.7(2)	41181	Inspection: Inspection Reports: These reports shall include procedure reference and adequacy of the hoist/hoist components. (Requirement 41181)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.7(3)	41182	Inspection: Inspection Reports: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41182)	S	I	I	Mgmt			
NASA STD 8719.9	06.4.7(4)	41183	Inspection: Inspection Reports: These reports shall be filed and be made readily available by the organizational element responsible for hoist and winch inspection. (Requirement 41183)	S	I	I	Mgmt			
NASA STD 8719.9	06.5(1)	41184	Maintenance: A maintenance program based on manufacturers' recommendations, integrating proactive, reactive, preventive, and predictive maintenance shall be established to increase the probability the hoist or winch will function in the required manner over its design life cycle with a minimum of maintenance.	S	I	I	Mgmt			
NASA STD 8719.9	06.5(2)	41185	Maintenance: The program shall include procedures and a scheduling system for normal periodic maintenance items, adjustments, replacements, and repairs.	S	I	I	Mgmt			
NASA STD 8719.9	06.5(3)	41186	Maintenance: The program shall also ensure that records are kept and unsafe test and inspection discrepancies are documented and corrected.	S	I	I	Mgmt			
NASA STD 8719.9	06.5(4)	41187	Maintenance: Any hoist or winch found in an unsafe operating condition shall be tagged out and removed from service until repaired.	S	I	I	Mgmt			
NASA STD 8719.9	06.5(5)	41188	Maintenance: All repairs shall be made by qualified personnel in accordance with the manufacturers' instructions.	S	I	I	Mgmt			
NASA STD 8719.9	06.5.1	41189	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: (Requirement 41189)	S	I	I	Mgmt			
NASA STD 8719.9	06.5.1.c	41192	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: If power has to be on, "Warning," "Out-of-Order," or a like sign shall be placed in a conspicuous location or an operator shall remain at the pendant.	S	I	I	Mgmt			
NASA STD 8719.9	06.5.1.d	41193	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are initiated, the following safety precautions shall be taken: Hoists and winches shall not be operated until all safety devices have been activated and tested/adjusted if involved in the maintenance action.	S	I	I	Mgmt			
NASA STD 8719.9	06.5.2	41194	Maintenance: Adjustments. Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all hoist components function properly, paying particular attention to: (Requirement 41194)	S	I	I	Mgmt			
NASA STD 8719.9	06.5.2.a	41195	Maintenance: Adjustments. Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all hoist components function properly, paying particular attention to: Brakes. Appropriate precautions shall be taken by inspectors, repair personnel, and others who may be potentially exposed to airborne dust fibers from any asbestos friction materials present in braking mechanisms.	S	I	I	Mgmt			
NASA STD 8719.9	06.5.2.c.1	41198	Maintenance: Adjustments. Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all hoist components function properly, paying particular attention to: Limit switches: The hoist initial upper limit switch shall be verified by running the empty hook at full speed into the limit switch. It is recommended that the switch be verified at slow speed prior to adjustment.	S	I	I	Mgmt			



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NASA STD 8719.9	06.5.2.c.2	41199	Maintenance: Adjustments. Based upon the manufacturer's documentation and/or experience, adjustments shall be made to ensure that all hoist components function properly, paying particular attention to: Limit switches: For hoists and winches used for critical lifts, the final upper limit switch shall be independently verified and adjusted as described above at installation and after modifications that could affect switch operation. The switch can be tested periodically by manually tripping it and verifying that all hoist motion is precluded.	S	I	I	Mgmt			
NASA STD 8719.9	06.5.3	41202	Maintenance: Repairs and Replacements. Repairs or replacements shall be provided for safe operation. Special attention shall be given to: (Requirement 41202)	S	I	I	Mgmt			
NASA STD 8719.9	06.5.3.d	41206	Maintenance: Repairs and Replacements. Repairs or replacements shall be provided for safe operation. Special attention shall be given to: For repair/replacement requirements for hoist and winch hooks with deformation or cracks, see Section 7. If repaired, hoist and winch hooks shall be proof load tested using the associated hoist or winch proof load value.	S	I	I	Mgmt			
NASA STD 8719.9	06.5.3.e	41207	Maintenance: Repairs and Replacements. Repairs or replacements shall be provided for safe operation. Special attention shall be given to: The need to replace wire rope shall be determined by a certified otherwise qualified person based on an evaluation of inspection results. Any of the signs of deterioration and damage outlined in paragraph 6.4.5.a are sufficient reasons for questioning continued use of the rope (see Wire Rope Users Manual for additional information on wire rope inspections).	S	I	I	Mgmt			
NASA STD 8719.9	06.5.3.f	41208	Maintenance: Repairs and Replacements. Repairs or replacements shall be provided for safe operation. Special attention shall be given to: Replacement rope or chain shall be at least equal to the same size, grade, and construction as original furnished by the hoist or winch manufacturer. When replaced, perform a proof load test using the associated hoist or winch proof load value.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.1(1)	41210	Personnel Certification: Program. Only certified (licensed) and trained operators shall be authorized to use/operate powered hoists and winches except for platform hoists where procedural contrals can be provided in a technical operating procedure.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.1(2)	41211	Personnel Certification: Program: A training, examination, and licensing program shall be established or made available. (Requirement 41211)	S	I	I	Mgmt			
NASA STD 8719.9	06.6.1(3)	41212	Personnel Certification: Program: For those NASA installations that do not have a training program, all hoist and winch operators shall be trained and certified by a recognized hoist certification organization that normally performs this function.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.1(4)	41213	Personnel Certification: Program: The operator certification program will be reviewed at least annually to assure that the contents, training material, testing, and examination elements are up-to-date with current methods and techniques; and that any "lessons-learned" are adequately addressed. (Requirement 41213)	S	I	I	Mgmt			
NASA STD 8719.9	06.6.1(5)	41214	Personnel Certification: Program: Riggers (see Section 10) and personnel performing NDT (see paragraph 1.9) shall be certified in their discipline.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.1(6)	41215	Personnel Certification: Program: Training shall be provided to observers and flagmen.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.1(7)	41216	Personnel Certification: Program: All participants in the lifting operation shall have clearly defined roles and responsibilities.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2	41217	Personnel Certification: Levels. Two levels of operator training and proficiency will be established. Operations where critical lifts are involved will require a more rigid operator certification program than those operations that involve more routine lifts that do not involve critical hardware or unique hazards.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a	41218	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: (Requirement 41218)	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.1.a	41220	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Training: Classroom training in safety, lifting equipment emergency procedures, general performance standards, requirements, pre-operational checks, and safety-related defects and symptoms (for initial certification and as needed).	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.1.b	41221	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Training: Hands-on training (for initial certification and as needed).	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.1.c	41222	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Training: An annual review of the items in paragraph 6.6.2.a(1) above. (This may be conducted informally by local supervisory personnel.)	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.2.a	41224	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Physical examination (criteria to be determined by the cognizant medical official).	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.2.b	41225	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Written examination.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.2.c	41226	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Operational demonstration (for initial certification only).	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.2.d	41227	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Examination: Proficiency examination for recertification.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.3.a (1)	41229	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: An organizational element shall be designated to issue operator licenses/operator certification.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.3.a (2)	41230	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: Provisions shall be made to revoke licenses for negligence, violations of safety requirements, or failure to meet medical standards.	S	I	I	Mgmt			

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NASA STD 8719.9	06.6.2.a.3.a (3)	41231	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: Provisions shall be made for periodic checks of operators to verify they have licenses in their possession.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.3.a (4)	41232	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: The licenses shall indicate the type of hoist the holder is qualified to operate. Alternately, the organizational element may elect to maintain a master list of licensed operators instead of issuing individual licenses, providing copies of the list are readily available to assurance and supervisory personnel at the work site. (Requirement 41232)	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.3.b (1)	41233	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: Renewal of all licenses shall require demonstration of proficiency or approval of supervision that proficiency is adequate and current.	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.a.3.b (2)	41234	Personnel Certification: Levels: Noncritical Lifts. The certification program for noncritical lift operators shall include the following: Licensing/Operator Certification: Licenses or certifications shall expire at least every 4 years. Renewal procedures will be established by each licensing organization, but as a minimum, will include items in paragraphs 6.6.2.a(1) and 6.6.2.a(2). (Requirement 41234)	S	I	I	Mgmt			
NASA STD 8719.9	06.6.2.b	41235	Personnel Certification: Levels: Critical Lifts. Besides the training, examination, licensing, and renewal requirements for noncritical lifts, operators that are being certified to perform critical lifts must be trained in the specific hazards and special procedures associated with the lift. Operators must also demonstrate proficiency and operating finesse with the hoist using a test load as appropriate for the initial certification or alternately be immediately supervised by a certified operator during the first initial lifting period. The licenses will indicate specific hoists for which the operator is certified.	S	I	I	Mgmt			
NASA STD 8719.9	06.7(1)	41236	Operations. Hoists and winches shall be operated according to this section, the manufacturers' recommendations, and the applicable ASME standard.	S	I	I	Mgmt			
NASA STD 8719.9	06.7(2)	41237	Operations: The following practices shall be followed for hoist and winch operations: (Requirement 41237)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.a	41238	Operations: The following practices shall be followed for hoist and winch operations: Operators will adhere to all tags placed on the hoist or winch controls.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.b(1)	41239	Operations: The following practices shall be followed for hoist and winch operations: Before starting a hoist or winch, the operator shall be certain that all personnel are clear of the area. (Requirement 41239)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.b(2)	41240	Operations: The following practices shall be followed for hoist and winch operations: Operators shall not engage in practices that will divert their attention while operating a hoist.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.c	41241	Operations: The following practices shall be followed for hoist and winch operations: The operator shall test all controls before beginning an operation. If the controls do not operate properly, adjustments or repairs shall be made before operations begin. (Requirement 41241)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.d(1)	41242	Operations: The following practices shall be followed for hoist and winch operations: Hoists and winches shall not be loaded beyond rated load except during authorized tests. (Requirement 41242)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.d(2)	41243	Operations: The following practices shall be followed for hoist and winch operations: Platform systems shall not be loaded beyond maximum load as designated on the platform hoist system. (Requirement 41243)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.e	41244	Operations: The following practices shall be followed for hoist and winch operations: Hoists and winches shall not be used for handling personnel unless specifically designed for such purpose (see Section 9).	S	I	I	Mgmt			
NASA STD 8719.9	06.7.f	41245	Operations: The following practices shall be followed for hoist and winch operations: Personnel shall not be located under suspended or moving loads unless the operation adheres to the OSHA-approved NASA Alternate Standard for Suspended Load Operations (see Appendix A).	S	I	I	Mgmt			
NASA STD 8719.9	06.7.g(1)	41246	Operations: The following practices shall be followed for hoist and winch operations: An operator shall be at the hoist or winch controls at all times while a load is suspended. (Requirement 41246)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.g(2)	41247	Operations: The following practices shall be followed for hoist and winch operations: Due to the length of some NASA operations, an operator change may be required while a load is suspended. This shall be accomplished via a procedure designed for the specific hoist and operation, ensuring that the hoist or winch controls are manned at all times.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.h(1)	41248	Operations: The following practices shall be followed for hoist and winch operations: Before each lift or series of lifts, the operator shall functionally test proper operation of the upper limit switch with no load on the hook. (Requirement 41248)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.h(2)	41249	Operations: The following practices shall be followed for hoist and winch operations: Upper limit switches shall not be used as operating controls.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.i(1)	41250	Operations: The following practices shall be followed for hoist and winch operations: Hoists and winches shall not be used to load test items such as slings, platforms, or lifting fixtures unless specifically identified to do so based on a specified percentage of rated load and a safety analysis approved by the LDEM and the responsible safety, engineering, operations, and maintenance organizations.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.i(2)	41251	Operations: The following practices shall be followed for hoist and winch operations: Test procedures shall be approved by the responsible safety, engineering, operations, and maintenance organizations. This is to ensure that the hoist or winch is not damaged due to sudden unloading should the test article fail.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.i(3)	41252	Operations: The following practices shall be followed for hoist and winch operations: Appendix D, crane/hoist requirements to load test other lifting equipment, shall be followed.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.j	41253	Operations: The following practices shall be followed for hoist and winch operations: Installed or fixed air or electric powered hoists and winches, excluding platform systems, shall be operated by designated personnel only.	S	I	I	Mgmt			

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NASA STD 8719.9	06.7.k	41254	Operations: The following practices shall be followed for hoist and winch operations: The operator shall ensure that the hoist or winch is within inspection and periodic recertification intervals by examination of its tag(s) and/or appropriate documentation. (Requirement 41254)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.L	41255	Operations: The following practices shall be followed for hoist and winch operations: Outdoor hoisting operations should not commence if winds are above 20 knots (23 mph, 37 km/hr) steady state or if gusts exceed 35 knots (40 mph, 65 km/hr). Consideration shall also be given to sail area and weather conditions such as lightning or snow before commencing operations.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.m	41256	Operations: The following practices shall be followed for hoist and winch operations: Hoists and winches shall not be used for side pulls unless specifically designed to do so.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.n(1)	41257	Operations: The following practices shall be followed for hoist and winch operations: If radio communications are to be used, operators and/or lift supervisors shall test the communication system prior to each operation. (Requirement 41257)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.n(2)	41258	Operations: The following practices shall be followed for hoist and winch operations: Operations shall stop immediately upon communication loss and shall not continue until communication is restored.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.o(1)	41259	Operations: The following practices shall be followed for hoist and winch operations: If hand signals are required, only standard signals shall be used according to Appendix B. (Requirement 41259)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.o(2)	41260	Operations: The following practices shall be followed for hoist and winch operations: Hand signals shall be posted in a conspicuous location. (Requirement 41260)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.p(1)	41261	Operations: The following practices shall be followed for hoist and winch operations: The operator shall know the weight of the working load.	S	I	I	Mgmt			
NASA STD 8719.9	06.7.p(2)	41262	Operations: The following practices shall be followed for hoist and winch operations: When raising loads that approach 75% of the rated capacity of the hoist or winch, the operator shall test the holding brakes. (Requirement 41262)	S	I	I	Mgmt			
NASA STD 8719.9	06.7.p(3)	41263	Operations: The following practices shall be followed for hoist and winch operations: The brakes shall be tested by raising the load minimally above the surface and holding the load with the brake. The load should be held long enough to allow any dynamics to dampen out. (Requirement 41263)	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1	41266	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's. (Requirement 41266)	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1.a(1)	41267	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: DOT-packaged explosives shall be handled in accordance with approved hazardous operating procedures. (Requirement 41267)	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1.a(2)	41268	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: Barricades and warning signs shall be erected to control access. (Requirement 41268)	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1.b(1)	41269	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: Explosives and EED's that are not within DOT-approved containers shall be handled in accordance with approved hazardous operations procedures.	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1.b(2)	41270	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: (Requirement 41270)	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1.b.1	41271	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: Voltage checks on crane hooks that will handle explosives or EED's shall be performed prior to the start of operations; all crane motions shall be checked.	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1.b.2(1)	41272	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: For static sensitive systems, the crane hook shall be connected to facility ground before connecting to explosives or EED's. (Requirement 41272)	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1.b.2(2)	41273	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: Electrical grounding of the hook and load shall be accomplished prior to lifting operations. If a ground connection must be disconnected to facilitate operations, an alternate ground should be connected prior to disconnecting the existing ground. The final attachment/detachment must be at least 10 feet (3 m) from exposed propellant grain, explosives, or EED's.	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1.b.3	41274	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: The danger potential for radio transmissions near explosives shall be evaluated prior to the operation.	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1.b.4	41275	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: Personnel limits, protective clothing, warning signs and barricades shall be used as required. (Requirement 41275)	S	I	I	Mgmt			
NASA STD 8719.9	06.8.1.b.5	41276	Special Criteria: Handling Explosives or Electro-Explosive Devices (EED's). Special precautions shall be taken while handling explosives or EED's: In addition to system configuration controls, these procedures shall ensure the following requirements are met: Safety surveillance requirements shall be followed.	S	I	I	Mgmt			

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NASA STD 8719.9	06.8.2	41277	Special Criteria: Policy shall be developed and enforced for hoist operation during electrical storms. Operations are generally permitted without restriction within enclosed metal or framed buildings that are properly grounded. Restrictions are necessary for outside operations or for those that cannot tolerate power failure/loss.	S	I	I	Mgmt			
NASA STD 8719.9	07.2(1)	41280	Safety and Design Criteria. Hooks shall meet the manufacturer's recommendations, and shall not be overloaded. Swiveling hooks should rotate 360 degrees on antifriction bearings with means for lubrication. If grease is a contamination concern, drip funnels (cups), nonlubricated bearings, or permanently lubricated sealed bearings should be provided.	S	I	I	Mgmt			
NASA STD 8719.9	07.2(2)	41281	Safety and Design Criteria: A latch or mousing shall be provided to bridge the throat opening of the hook to retain slings, chains, or other similar parts under slack conditions.	S	I	I	Mgmt			
NASA STD 8719.9	07.2(3)	41282	Safety and Design Criteria: Hooks on cranes used for lifting people shall be a lockable type as required by ASME B30.23. (Requirement 41282)	S	I	I	Mgmt			
NASA STD 8719.9	07.3(1)	41283	Testing. Hooks shall be required to pass the tests of the equipment of which they are a part.	S	I	I	Mgmt			
NASA STD 8719.9	07.3(2)	41284	Testing: Written, dated, and signed test reports shall be prepared together with the test reports for the equipment of which the hooks are a part. (Requirement 41284)	S	I	I	Mgmt			
NASA STD 8719.9	07.3(3)	41285	Testing: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use.	S	I	I	Mgmt			
NASA STD 8719.9	07.4.1	41287	Inspection: Hooks shall be inspected during the daily and periodic inspections of the equipment of which they are a part. (Requirement 41287)	S	I	I	Mgmt			
NASA STD 8719.9	07.4.2	41288	Inspection: Daily Inspections. These inspections shall be performed each day the lifting equipment is used. Inspect for: (Requirement 41288)	S	I	I	Mgmt			
NASA STD 8719.9	07.4.3(1)	41293	Inspection: Periodic Inspections. These inspections shall be performed at varying intervals depending on activity, severity of service, environment, and criticality. (Requirement 41293)	S	I	I	Mgmt			
NASA STD 8719.9	07.4.3(2)	41294	Inspection: Periodic Inspections: The following inspections shall be performed at least once per year. Inspect for: (Requirement 41294)	S	I	I	Mgmt			
NASA STD 8719.9	07.4.4	41299	Inspection: Visual inspection of painted hooks requires consideration of the coating. Surface variations may indicate heavy or severe service. Such instances may call for stripping the paint to allow for more detailed analysis.	S	I	I	Mgmt			
NASA STD 8719.9	07.4.5(1)	41300	Inspection: NDT. Hooks shall be given a surface NDT (see paragraphs 3.1.35 and 3.1.57) immediately after all periodic load and proof load tests and prior to further use of the hook. Cracks are not acceptable. Linear indications greater than 1/8 inch long whose length is equal to or greater than three times its width are not acceptable. A visual inspection of hooks used for noncritical lifts (if not attached to a crane) and sling hooks of 5 tons or less is acceptable. (Requirement 41300)	S	I	I	Mgmt			
NASA STD 8719.9	07.4.5(2)	41301	Inspection: NDT: All new crane hooks shall undergo a volumetric NDT (if determined necessary by the LDEM and the responsible design engineering organization) followed by a proof load test in accordance with ASME B30.10 followed by a surface NDT. (Requirement 41301)	S	I	I	Mgmt			
NASA STD 8719.9	07.4.5(3)	41302	Inspection: NDT: Personnel performing NDT shall be qualified and certified in accordance with paragraph 1.9.	S	I	I	Mgmt			
NASA STD 8719.9	07.4.6(1)	41303	Inspection: Written, dated, and signed inspections reports shall be prepared in conjunction with inspection reports for the equipment of which the hooks are a part. (Requirement 41303)	S	I	I	Mgmt			
NASA STD 8719.9	07.4.6(2)	41304	Inspection: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41304)	S	I	I	Mgmt			
NASA STD 8719.9	07.5.1(1)	41306	Maintenance: Hooks with deficiencies as noted in paragraph 7.4 shall be removed from service and replaced or repaired. (Requirement 41306)	S	I	I	Mgmt			
NASA STD 8719.9	07.5.1(2)	41307	Maintenance: Replacement shall be with original equipment or equal.	S	I	I	Mgmt			
NASA STD 8719.9	07.5.1(3)	41308	Maintenance: Repair shall require approval by certified or otherwise qualified personnel. Minor grinding of cracks is not considered a repair providing an approved procedure is used. (Requirement 41308)	S	I	I	Mgmt			
NASA STD 8719.9	07.5.2	41309	Maintenance: Cracks, nicks, and gouges shall be repaired by grinding longitudinally, following the contour of the hook, provided that no dimension is reduced more than 10 percent (or as recommended by the manufacturer) of its original value. (Requirement 41309)	S	I	I	Mgmt			
NASA STD 8719.9	07.5.3	41310	Maintenance: If repaired, hooks shall be proof load tested using the associated lifting device/equipment proof load value. (Requirement 41310)	S	I	I	Mgmt			
NASA STD 8719.9	07.5.4	41311	Maintenance: A system shall be established for tracking/documenting the maintenance and repair history of hooks.	S	I	I	Mgmt			
NASA STD 8719.9	7.6	41312	Operations. The following practices shall be followed when using hooks: (Requirement 41312)	S	I	I	Mgmt			
NASA STD 8719.9	07.6.a	41313	Operations. The following practices shall be followed when using hooks: Loads shall be centered in the base (bowl saddle) of the hook, to avoid point loading. (Requirement 41313)	S	I	I	Mgmt			
NASA STD 8719.9	07.6.b	41314	Operations. The following practices shall be followed when using hooks: Hooks shall not be side or back loaded. (Requirement 41314)	S	I	I	Mgmt			
NASA STD 8719.9	07.6.c	41315	Operations. The following practices shall be followed when using hooks: Duplex sister hooks shall be equally loaded on both sides, and the pin hole shall not be point loaded or loaded beyond the rated load of the hook except for testing. (Requirement 41315)	S	I	I	Mgmt			
NASA STD 8719.9	08.2.1	41319	Safety and Design Aspects: Design Criteria. Hydra-sets used for critical lifts shall have a 5 to 1 design factor based on ultimate strength for load bearing elements.	S	I	I	Mgmt			
NASA STD 8719.9	08.2.2.a	41321	Safety and Design Aspects: Labeling/Tagging of Hydra-Sets and Load Measuring Devices: The rated load shall be plainly marked on each Hydra-set and load measuring device (unless permanent part of lifting device). (Requirement 41321)	S	I	I	Mgmt			
NASA STD 8719.9	08.2.2.b	41322	Safety and Design Aspects: Labeling/Tagging of Hydra-Sets and Load Measuring Devices: Hydra-sets and load measuring devices that have the necessary design features, maintenance/inspection, and test intervals to lift critical loads will be marked conspicuously so that the operator and assurance personnel can distinguish that the Hydra-set and load measuring device (unless permanent part of lifting device) are qualified for critical lifts.	S	I	I	Mgmt			

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NASA STD 8719.9	08.2.2.c	41323	Safety and Design Aspects: Labeling/Tagging of Hydra-Sets and Load Measuring Devices: A standard system of labeling shall be established and used throughout the installation. (Requirement 41323)	S	I	I	Mgmt			
NASA STD 8719.9	08.2.2.d	41324	Safety and Design Aspects: Labeling/Tagging of Hydra-Sets and Load Measuring Devices: A standard lockout/tagout system shall be established and used throughout the installation to indicate equipment that is not to be used due to inspection discrepancies, ongoing maintenance operations, or other reason. (Requirement 41324)	S	I	I	Mgmt			
NASA STD 8719.9	08.2.2.e	41325	Safety and Design Aspects: Labeling/Tagging of Hydra-Sets and Load Measuring Devices: Certification/recertification tags are required as described in paragraph 8.3.5. (Requirement 41325)	S	I	I	Mgmt			
NASA STD 8719.9	08.2.3(1)	41326	Safety and Design Aspects: Safety Analysis and Documentation of Hydra-Sets Used for Critical Lifts. A recognized safety hazard analysis such as fault tree analysis, FMEA, O&SHA shall be performed on all Hydra-sets used for critical lifts. (Requirement 41326)	S	I	I	Mgmt			
NASA STD 8719.9	08.2.3(2)	41327	Safety and Design Aspects: Safety Analysis and Documentation of Hydra-Sets Used for Critical Lifts: The analysis shall, as a minimum, determine potential sources of danger, identify failure modes, and recommend resolutions and a system of risk acceptance for those conditions found in the hardware-facility-environment-human relationship that could cause loss of life, personal injury, and loss of or damage to the Hydra-set, facility, or load.	S	I	I	Mgmt			
NASA STD 8719.9	08.2.3(3)	41328	Safety and Design Aspects: Safety Analysis and Documentation of Hydra-Sets Used for Critical Lifts: The analysis shall be done as part of the initial evaluation process for critical lift compliance and prior to use in a critical lift, included in the Hydra-set documentation, and updated as required to reflect any changes in operation and/or configuration. (Requirement 41328)	S	I	I	Mgmt			
NASA STD 8719.9	08.3(1)	41329	Testing. Three types of tests are required: proof load tests, periodic load tests, and operational tests. The acceptable tolerance for load test accuracy is +5/-0 percent. An inspection shall be performed after each load test and prior to release for service to ensure there is no damage. If cracks are suspected, suitable NDT techniques should be used to determine their extent.	S	I	I	Mgmt			
NASA STD 8719.9	08.3(2)	41330	Testing: Tests shall be performed by qualified personnel according to written (specific or general) technical procedures.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.1(1)	41331	Testing: Hydra-set Proof Load Test. Before first use, all new, extensively repaired, modified, or altered Hydra-sets shall undergo a proof load at 200 percent of rated load. (Requirement 41331)	S	I	I	Mgmt			
NASA STD 8719.9	08.3.1(2)	41332	Testing: Hydra-set Proof Load Test: Proof load tests shall be performed with piston rod fully extended to prevent instrument and seal damage.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.2(1)	41333	Testing: Hydra-set Periodic Load Test. Load tests shall be performed with the piston rod fully extended to prevent instrument and seal damage.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.2(2)	41334	Testing: Hydra-set Periodic Load Test: All Hydra-sets shall be tested at 100 percent of rated load at least every 4 years.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.2(3)	41335	Testing: Hydra-set Periodic Load Test: Tests of Hydra-sets used for critical lifts shall be based on frequency of usage.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.2(4)	41336	Testing: Hydra-set Periodic Load Test: Hydra-sets used infrequently for critical lifts shall be load tested before each critical lift if it has been more than one year since the last test.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.2(5)	41337	Testing: Hydra-set Periodic Load Test: Hydra-sets used frequently for critical lifts shall be load tested at least once per year.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.3	41338	Testing: Hydra-set Operational Test. The following shall be performed in conjunction with proof load tests and periodic load tests and at least once per year: (Requirement 41338)	S	I	I	Mgmt			
NASA STD 8719.9	08.3.4(1)	41342	Testing: Load Measuring Device Periodic Load Test. Before first use, all new, extensively repaired, modified, or altered load measuring devices shall undergo a load test at rated capacity.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.4(2)	41343	Testing: Load Measuring Device Periodic Load Test: All load measuring devices shall be tested at rated capacity at least once every 4 years.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.4(3)	41344	Testing: Load Measuring Device Periodic Load Test: Load measuring devices used for critical lifts shall be load tested at least once per year.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.4(4)	41345	Testing: Load Measuring Device Periodic Load Test: Load measuring devices used infrequently for critical lifts shall be load tested before each critical lift if it has been more than one year since the last test.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.4(5)	41346	Testing: Load Measuring Device Periodic Load Test: Calibration of load measuring devices satisfies the load test requirement.	S	I	I	Mgmt			
NASA STD 8719.9	08.3.5(1)	41347	Testing: Test Reports and Periodic Recertification Tags. After each load test and/or inspection, written, dated, and signed reports shall be prepared. (Requirement 41347)	S	I	I	Mgmt			
NASA STD 8719.9	08.3.5(2)	41348	Testing: Test Reports and Periodic Recertification Tags: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41348)	S	I	I	Mgmt			
NASA STD 8719.9	08.3.5(3)	41349	Testing: Test Reports and Periodic Recertification Tags: These reports shall be kept on file by the responsible owner organization for a minimum of two test cycles and shall be made readily available. (Requirement 41349)	S	I	I	Mgmt			
NASA STD 8719.9	08.3.5(4)	41350	Testing: Test Reports and Periodic Recertification Tags: Following the periodic load test, all Hydra-sets and load measuring devices (unless permanent part of lifting device) shall have a permanently affixed tag or label, identifying the equipment and stating the next required periodic load test date or the load test expiration date. (Requirement 41350)	S	I	I	Mgmt			
NASA STD 8719.9	08.4.1(1)	41352	Inspection: Inspections, as described below, shall be performed on all Hydra-sets. (Requirement 41352)	S	I	I	Mgmt			
NASA STD 8719.9	08.4.1(2)	41353	Inspection: Inspections shall be performed according to this section and the manufacturers' recommendations.	S	I	I	Mgmt			
NASA STD 8719.9	08.4.1(3)	41354	Inspection: Inadequacies discovered during an inspection shall be documented and, if determined to be a hazard, tagged out and corrected prior to further use. (Requirement 41354)	S	I	I	Mgmt			
NASA STD 8719.9	08.4.1(4)	41355	Inspection: Inspections shall be performed by qualified personnel according to approved technical operating procedures.	S	I	I	Mgmt			

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NASA STD 8719.9	08.4.2	41356	Inspection: All new, extensively repaired, or modified Hydra-sets shall be given a daily and a periodic inspection prior to first use. For component repair on Hydra-sets, only the inspections that apply to the repaired portion need to be performed prior to first use unless a periodic inspection interval expires during the downtime (see paragraph 8.4.5).	S	I	I	Mgmt			
NASA STD 8719.9	08.4.3(1)	41357	Inspection: Hydra-sets in regular service (used at least once a month) shall be inspected as required in paragraphs 8.4.4 and 8.4.5. (Requirement 41357)	S	I	I	Mgmt			
NASA STD 8719.9	08.4.3(2)	41358	Inspection: Idle and standby Hydra-sets shall be inspected according to paragraph 8.4.6.	S	I	I	Mgmt			
NASA STD 8719.9	08.4.4	41359	Inspection: Daily inspections. These inspections shall be performed by the certified operator prior to first use each day the Hydra-set is used, and shall include the following: (Requirement 41359)	S	I	I	Mgmt			
NASA STD 8719.9	08.4.5	41365	Inspection: Periodic Inspections. Periodic inspections are the same as paragraph 8.4.4. Periodic inspections shall be performed at least once per year or more frequently if required by the manufacturer. Periodic inspections consist of visual inspection by an appointed person and require dated documented records. (Requirement 41365)	S	I	I	Mgmt			
NASA STD 8719.9	08.4.6	41366	Inspection: Idle and Standby Hydra-sets. Idle and standby Hydra-sets shall be inspected prior to first use according to the requirements of paragraphs 8.4.4 and 8.4.5 unless these daily and periodic inspections were performed at required intervals and recorded during the idle/standby period. (Requirement 41366)	S	I	I	Mgmt			
NASA STD 8719.9	08.5(1)	41367	Maintenance: A maintenance program based on manufacturers' recommendations, integrating proactive, reactive, preventive, and predictive maintenance shall be established to increase the probability the Hydra-set or load measuring device will function in the required manner over its design life cycle with a minimum of maintenance.	S	I	I	Mgmt			
NASA STD 8719.9	08.5(2)	41368	Maintenance: The program shall include procedures and a scheduling system for normal periodic maintenance items, adjustments, replacements, and its repairs.	S	I	I	Mgmt			
NASA STD 8719.9	08.5(3)	41369	Maintenance: The program also shall ensure that records are kept and unsafe test and inspection discrepancies are documented and corrected.	S	I	I	Mgmt			
NASA STD 8719.9	08.5(4)	41370	Maintenance: Any Hydra-set or load measuring device found in an unsafe operating condition shall be tagged out and removed from service until repaired. (Requirement 41370)	S	I	I	Mgmt			
NASA STD 8719.9	08.5(5)	41371	Maintenance: All repairs shall be made by qualified personnel in accordance with the manufacturers' instructions.	S	I	I	Mgmt			
NASA STD 8719.9	08.6.1	41373	Personnel Certification: A training and operator certification program that specifically addresses the properties of Hydra-sets and operational procedures needed to retain positive control of the same during close mating operations shall be implemented. Elements of the initial training and certification program will include a review of the above procedures, hands-on training, and an operational demonstration.	S	I	I	Mgmt			
NASA STD 8719.9	08.6.2	41374	Personnel Certification: Licensing/operator certification will be issued every 4 years. Renewal shall require demonstration of proficiency or approval of supervision that proficiency is adequate and current.	S	I	I	Mgmt			
NASA STD 8719.9	8.7	41375	Operations. The following shall be followed for Hydra-set operations: (Requirement 41375)	S	I	I	Mgmt			
NASA STD 8719.9	08.7.a	41376	Operations. The following shall be followed for Hydra-set operations: When Hydra-set seals are replaced, an operational test and inspection shall be performed.	S	I	I	Mgmt			
NASA STD 8719.9	08.7.b	41377	Operations. The following shall be followed for Hydra-set operations: Hydra-sets shall be stored in their appropriate handling containers when not in use.	S	I	I	Mgmt			
NASA STD 8719.9	08.7.c	41378	Operations. The following shall be followed for Hydra-set operations: Hydra-sets and load measuring devices (unless permanent part of lifting device) shall be clearly and permanently marked with rated load value.	S	I	I	Mgmt			
NASA STD 8719.9	08.7.d(1)	41379	Operations. The following shall be followed for Hydra-set operations: Prior to use, the operator shall ensure the Hydra-set and load measuring device (unless permanent part of lifting device) are within the inspection and periodic recertification intervals by examination of the load test tag(s), load test label(s), and/or documentation.	S	I	I	Mgmt			
NASA STD 8719.9	08.7.d(2)	41380	Operations. The following shall be followed for Hydra-set operations: The operator shall adhere to all tags on the controls.	S	I	I	Mgmt			
NASA STD 8719.9	08.7.e	41381	Operations. The following shall be followed for Hydra-set operations: Hydraulically controlled Hydra-sets are preferred over pneumatically controlled Hydra-sets where close mating operations or accurate control of distances is required. Pneumatically controlled Hydra-sets shall not be used for these operations unless the following items are incorporated:	S	I	I	Mgmt			
NASA STD 8719.9	08.7.e.1	41382	Operations. The following shall be followed for Hydra-set operations: Pneumatically controlled Hydra-sets shall not be used for these operations unless the following items are incorporated: Installation of a fail-safe check valve in the Hydra-set. This is installed on the Hydra-set pneumatic feedline and "locks up" the Hydra-set in the event of a drop or loss of pneumatic control system pressure. A procedure shall be developed and implemented to ensure that the valve is set to an appropriate sensitivity. Normally, the valve is set at the mid-point of its range, which is satisfactory for most operations. However, depending on the specifics of the lift, it may be necessary to reset the valve using a dummy load as outlined in the manufacturer's recommended procedures.	S	I	I	Mgmt			
NASA STD 8719.9	08.7.e.3	41384	Operations. The following shall be followed for Hydra-set operations: Pneumatically controlled Hydra-sets shall not be used for these operations unless the following items are incorporated: Installation of electronic remote position indicators that warn operators of small movements of the hung load. However, these should only be installed if they will not adversely affect the operation or contamination control features of existing Hydra-sets.	S	I	I	Mgmt			

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NASA STD 8719.9	09.2.1	41389	Safety and Design Aspects: Generally, any time personnel must be raised or lowered with hoisting equipment, ASME A17.1 should be used. Only when unique project requirements dictate that the elevator standard cannot be applied must special equipment be procured for raising and lowering personnel. In some cases, standard or custom designed equipment can be obtained from manufacturers regularly engaged in the design and construction of personnel lifting devices. This equipment must comply with applicable industry and government standards such as ANSI and OSHA and must be tested, maintained and inspected to their requirements and as required. When industry standards do not apply to a specific project requirement, then a system with an equivalent level of safety must be provided as outlined herein with appropriate concurrence of the applicable design, operations, and safety engineers.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.2.a(1)	41391	Safety and Design Aspects: Labeling/Tagging of Special Hoist Supported Personnel Lifting Devices: The rated load/applicable capacity ratings shall be clearly marked on the personnel lifting device. (Requirement 41391)	S	I	I	Mgmt			
NASA STD 8719.9	09.2.2.a(2)	41392	Safety and Design Aspects: Labeling/Tagging of Special Hoist Supported Personnel Lifting Devices: The rated capacity of the personnel lifting device shall be clearly marked at the entrance-way, and warnings, cautions, and restrictions for safe operations shall be provided according to the applicable industry and government standards. (Requirement 41392)	S	I	I	Mgmt			
NASA STD 8719.9	09.2.2.b	41393	Safety and Design Aspects: Labeling/Tagging of Special Hoist Supported Personnel Lifting Devices: A standard system of labeling shall be established and used throughout the installation.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.2.c	41394	Safety and Design Aspects: Labeling/Tagging of Special Hoist Supported Personnel Lifting Devices: A standard lockout/tagout system shall be established and used throughout the installation to indicate equipment that is not to be used due to inspection discrepancies, ongoing maintenance, or other reasons. (Requirement 41394)	S	I	I	Mgmt			
NASA STD 8719.9	09.2.3(1)	41396	Safety and Design Aspects: Safety Analysis and Documentation of Special Hoist Supported Personnel Lifting Devices. A recognized safety hazard analysis such as fault tree analysis, FMEA, O&SHA shall be performed on all special hoist supported personnel lifting devices. (Requirement 41396)	S	I	I	Mgmt			
NASA STD 8719.9	09.2.3(2)	41397	Safety and Design Aspects: Safety Analysis and Documentation of Special Hoist Supported Personnel Lifting Devices: The analysis shall be done as a minimum, determine potential sources of danger, identify failure modes, and recommend resolutions and a system of risk acceptance for those conditions found in the hardware-facility-environment-human relationship that could cause loss of life, personal injury, and loss of or damage to the lifting device, facility or load.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.3(3)	41398	Safety and Design Aspects: Safety Analysis and Documentation of Special Hoist Supported Personnel Lifting Devices: The analysis shall be done as part of the initial evaluation process for critical lift compliance and prior to use in a critical lift, included in the lifting device documentation, and updated as required to reflect any changes in operation and/or configuration. (Requirement 41398)	S	I	I	Mgmt			
NASA STD 8719.9	09.2.4(1)	41399	Safety and Design Aspects: General Design Requirements. The design shall produce a personnel lifting device that will lift, lower, sustain, and transport personnel safely.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.4(2)	41400	Safety and Design Aspects: General Design Requirements: The structure, mechanism, and material shall be of sufficient strength to meet operational and testing requirements and shall comply with applicable industry and government standards as a minimum and in addition, the requirements outlined in this section.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.4(3)	41401	Safety and Design Aspects: General Design Requirements: Besides the requirements in Section 6, paragraphs 6.2.4, 6.2.5, 6.2.6, and 6.2.7, the following requirements shall be met for all hoist supported personnel lifting devices: (Requirement 41401)	S	I	I	Mgmt			
NASA STD 8719.9	09.2.4.a	41402	Safety and Design Aspects: General Design Requirements: Besides the requirements in Section 6, paragraphs 6.2.4, 6.2.5, 6.2.6, and 6.2.7, the following requirements shall be met for all hoist supported personnel lifting devices: It is the responsibility of design, operations, and safety engineers to ensure that the design, testing, operations, maintenance, and inspection of this equipment comply with the applicable industry and government standards. Most hoist supported personnel lifting devices should comply with applicable industry standards. ASME A120.1, A39 and A10 series, and OSHA standards establish the configuration, materials, design stresses, safety devices, power and control, test, operation, inspection, and maintenance requirements that should be followed.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.4.b(1)	41403	Safety and Design Aspects: General Design Requirements: Besides the requirements in Section 6, paragraphs 6.2.4, 6.2.5, 6.2.6, and 6.2.7, the following requirements shall be met for all hoist supported personnel lifting devices: When industry standards do not cover a unique project requirement, then a system with an equivalent level of safety must be provided. This system may consist of two separate independent support systems; that is, two separate hoists such that the failure of one hoist, its reeving system, or other component will not cause the stability of the personnel lifting device to be lost or prohibit its movement to a safe location. With this configuration, alternate materials or higher design stresses than permitted by industry and OSHA standards can be used with concurrence from the appropriate design, operations, and safety engineers. Another option may consist of lifting equipment with at least two holding brakes and additional factors of safety for the hoist load bearing components. The option selected shall be approved by the LDEM with concurrence from the responsible safety, engineering, operations, and maintenance organizations.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.4.b(2)	41404	Safety and Design Aspects: General Design Requirements: Besides the requirements in Section 6, paragraphs 6.2.4, 6.2.5, 6.2.6, and 6.2.7, the following requirements shall be met for all hoist supported personnel lifting devices: Operation, maintenance, and inspection requirements shall be developed to provide equivalent verification of equipment as required by industry and OSHA standards and as outlined in this section.	S	I	I	Mgmt			

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NASA STD 8719.9	09.2.4.c(1)	41405	Safety and Design Aspects: General Design Requirements: Besides the requirements in Section 6, paragraphs 6.2.4, 6.2.5, 6.2.6, and 6.2.7, the following requirements shall be met for all hoist supported personnel lifting devices: A method for safe egress of personnel or emergency lowering to the ground level or other safe location shall be provided.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.4.c(2)	41406	Safety and Design Aspects: General Design Requirements: Besides the requirements in Section 6, paragraphs 6.2.4, 6.2.5, 6.2.6, and 6.2.7, the following requirements shall be met for all hoist supported personnel lifting devices: The emergency lowering shall be clearly marked and accessible from the ground or fixed structure.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.4.d	41407	Safety and Design Aspects: General Design Requirements: Besides the requirements in Section 6, paragraphs 6.2.4, 6.2.5, 6.2.6, and 6.2.7, the following requirements shall be met for all hoist supported personnel lifting devices: An emergency stop device that deenergizes the powered systems and stops the personnel lifting device movement shall be provided to the personnel controlling movement of this personnel lifting device. An additional emergency stop separate from normal operating controls should be considered for personnel at ground level or on a fixed structure to enhance operational safety.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.4.e(1)	41408	Safety and Design Aspects: General Design Requirements: Besides the requirements in Section 6, paragraphs 6.2.4, 6.2.5, 6.2.6, and 6.2.7, the following requirements shall be met for all hoist supported personnel lifting devices: All directional controls shall be designed so that they automatically return to a neutral position when released.	S	I	I	Mgmt			
NASA STD 8719.9	09.2.4.e(2)	41409	Safety and Design Aspects: General Design Requirements: Besides the requirements in Section 6, paragraphs 6.2.4, 6.2.5, 6.2.6, and 6.2.7, the following requirements shall be met for all hoist supported personnel lifting devices: Neutral position of controls shall bring the unit to a safe stop and hold the unit in that position until commanded to move to another position.	S	I	I	Mgmt			
NASA STD 8719.9	09.3(1)	41410	Testing: Testing of personnel lifting devices shall be completed according to its applicable industry standard and OSHA requirements.	S	I	I	Mgmt			
NASA STD 8719.9	09.3(2)	41411	Testing: The responsible design, operations, and safety engineers shall develop and oversee these tests for each system as required by these standards as described in this section.	S	I	I	Mgmt			
NASA STD 8719.9	09.3(3)	41412	Testing: The following tests shall also be completed (or combined with industry requirements when practical to avoid duplication of efforts). Three types of tests are required for personnel lifting devices: proof load tests, periodic load tests, and operational tests. (Requirement 41412)	S	I	I	Mgmt			
NASA STD 8719.9	09.3(4)	41413	Testing: Proof load tests and operational tests shall be performed prior to first use for new or extensively repaired or altered components directly involved in the hoist or personnel lifting device load path. Repairs or alterations to nonlifting or holding components do not require a load test, although a functional check should be performed to determine if the repairs or alterations are acceptable. (Requirement 41413)	S	I	I	Mgmt			
NASA STD 8719.9	09.3(5)	41414	Testing: The periodic load and operational tests shall be performed annually. (Requirement 41414)	S	I	I	Mgmt			
NASA STD 8719.9	09.3(6)	41415	Testing: If a personnel lifting device is upgraded, a proof load test and an operational test shall be performed based on the upgraded rating. The acceptable tolerance for load test accuracy is +5/-0 percent. (Requirement 41415)	S	I	I	Mgmt			
NASA STD 8719.9	09.3(7)	41416	Testing: All load and operational tests shall be performed by qualified personnel according to written (specific or general) technical operating procedures.	S	I	I	Mgmt			
NASA STD 8719.9	09.3(8)	41417	Testing: An inspection of the personnel lifting device and its components shall be performed after each load test and prior to the device being released for service to ensure there is no damage. (Requirement 41417)	S	I	I	Mgmt			
NASA STD 8719.9	09.3(9)	41418	Testing: Surface or volumetric NDT of critical components shall be used to validate the existence or absence of cracks or other load test effects indicated by this inspection. The periodic load test requirement may be fulfilled by a concurrently performed proof load test. (Requirement 41418)	S	I	I	Mgmt			
NASA STD 8719.9	09.3.1(1)	41419	Testing: Proof Load Test. Before first use, all new, extensively repaired, extensively modified, or altered personnel lifting devices shall undergo a proof load test at 1.5 times the rated load. A proof load test may also be performed when there is a question in design or previous testing. (Requirement 41419)	S	I	I	Mgmt			
NASA STD 8719.9	09.3.1(2)	41420	Testing: Proof Load Test: The load shall be secured to the personnel lifting device and lifted slowly and in an area where minimal damage will occur if the device fails. (Requirement 41420)	S	I	I	Mgmt			
NASA STD 8719.9	09.3.2	41421	Testing: Periodic Load Test. Each personnel lifting device shall be tested at least once every year with a load equal to the rated load. (Requirement 91073)	S	I	I	Mgmt			
NASA STD 8719.9	09.3.3	41422	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: (Requirement 41422)	S	I	I	Mgmt			
NASA STD 8719.9	09.3.3.c	41425	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: Determine trip setting of limit switches and limiting devices by tests under no load conditions. Conduct tests first by hand, if practical, and then under the slowest speed obtainable. Test with increasing speeds up to the maximum speed. Locate actuating mechanisms so that they will trip the switches or limiting devices in time to stop motion without damaging the hoist.	S	I	I	Mgmt			
NASA STD 8719.9	09.3.3.d	41426	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: After testing in the unloaded state, apply the test load to check for proper load control. Test load hoisting, lowering at various speeds (maximum safe movement up and down as determined by the LDEM and the responsible safety, engineering, operations, and maintenance organizations) and braking/holding mechanisms. Holding brakes shall be tested to verify stopping capabilities and demonstrate the ability to hold a rated load (see paragraph 9.3.3.e). The load should be held long enough to allow any dynamics to dampen out.	S	I	I	Mgmt			



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NASA STD 8719.9	09.3.3.e	41427	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: For hoist supported personnel lifting devices equipped with two means of braking (see paragraph 9.2.4.b) the operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways:	S	I	I	Mgmt			
NASA STD 8719.9	09.3.3.e.1	41428	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: For hoist supported personnel lifting devices equipped with two means of braking (see paragraph 9.2.4.b) the operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Each brake's ability to hold shall be statically tested (under no load) with 150 percent of the rated load hoisting torque at the point of brake application.	S	I	I	Mgmt			
NASA STD 8719.9	09.3.3.e.2	41429	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: For hoist supported personnel lifting devices equipped with two means of braking (see paragraph 9.2.4.b) the operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Alternately, each brake shall be tested for its ability to stop a rated load moving at full speed in the down direction. (CAUTION: It must be possible to quickly reenergize the out of circuit brake or provide other safety measures to perform this test safely.)	S	I	I	Mgmt			
NASA STD 8719.9	09.3.3.e.3	41430	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: For hoist supported personnel lifting devices equipped with two means of braking (see paragraph 9.2.4.b) the operational test must demonstrate each brake's ability to stop and hold a rated load. This can be done in one of the following ways: Other methods may be used as approved by the LDEM with concurrence from the responsible safety engineering, operations, and maintenance organizations.	S	I	I	Mgmt			
NASA STD 8719.9	09.3.3.f	41431	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: The operational test for a modified hoist supported personnel lifting device can be tailored to test only those portions of the equipment that were modified, only if the rated load and operational test interval has not expired.	S	I	I	Mgmt			
NASA STD 8719.9	09.3.4(1)	41432	Testing: Test Reports and Periodic Recertification Tags. After each test, designated personnel shall prepare written, dated, and signed test reports including procedure reference. (Requirement 41432)	S	I	I	Mgmt			
NASA STD 8719.9	09.3.4(2)	41433	Testing: Test Reports and Periodic Recertification Tags: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41433)	S	I	I	Mgmt			
NASA STD 8719.9	09.3.4(3)	41434	Testing: Test Reports and Periodic Recertification Tags: These reports shall be kept on file by the owner organization for a minimum of two test cycles and shall be made readily available. (Requirement 41434)	S	I	I	Mgmt			
NASA STD 8719.9	09.3.4(4)	41435	Testing: Test Reports and Periodic Recertification Tags: Following the periodic load test, personnel lifts shall be given a permanently affixed tag identifying the equipment and stating the next required periodic load test date or load test expiration date. (Requirement 41435)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.1(1)	41437	Inspection: Inspections, as described below, are required for personnel lifting devices. Inspections shall be completed according to its applicable industry standard and OSHA requirements and shall be performed on all personnel lifting devices.	S	I	I	Mgmt			
NASA STD 8719.9	09.4.1(2)	41438	Inspection: The responsible design, operation, and safety engineers shall develop and oversee the inspections for each system as required by these standards and as described herein. (Requirement 41438)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.1(3)	41439	Inspection: Inspections also shall be completed (or combined with industry requirements where practical to avoid duplication of efforts).	S	I	I	Mgmt			
NASA STD 8719.9	09.4.1(4)	41440	Inspection: Inadequacies discovered during an inspection shall be documented and, if determined to be a hazard, tagged out and corrected prior to further use. (Requirement 41440)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.1(5)	41441	Inspection: Inspections shall be performed by qualified personnel according to approved technical operating procedures.	S	I	I	Mgmt			
NASA STD 8719.9	09.4.2	41442	Inspection: All new, extensively repaired, or modified personnel lifting devices shall be given a daily and a periodic inspection prior to first use. For component repair on personnel lifts, only the inspections that apply to the repaired portion need to be performed prior to first use unless a periodic inspection interval expires during the downtime (see paragraph 9.4.5). (Requirement 41442)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.3(1)	41443	Inspection: Personnel lifts in regular service (used at least once a month) shall be inspected as required in paragraphs 9.4.4 and 9.4.5. (Requirement 41443)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.3(2)	41444	Inspection: Idle and standby personnel lifting devices shall be inspected according to paragraph 9.4.6. (Requirement 41444)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.4	41445	Inspection: Daily Inspections. These inspections shall be performed prior to first use each day the personnel lifting device is used, and shall include the following: (Requirement 41445)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.5	41453	Inspection: Periodic Inspection. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality. (Requirement 41453)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.5.a	41454	Inspection: Periodic Inspection. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Monthly Inspections (Frequent Inspections). At least once per month: (Requirement 41454)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.5.b	41472	Inspection: Periodic Inspection. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Annual Inspections (Periodic Inspections). At least once per year, inspect for: (Requirement 41472)	S	I	I	Mgmt			

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NASA STD 8719.9	09.4.5.b.02	41474	Inspection: Periodic Inspection. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Deformed, cracked, or corroded members and welds and loose bolts or rivets in personnel lift structure. Various methods of NDT such as ultrasonics, radiography, magnetic particle, or liquid penetrant shall be utilized as needed.	S	I	I	Mgmt			
NASA STD 8719.9	09.4.5.b.04	41476	Inspection: Periodic Inspection. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Annual Inspections (Periodic Inspections). At least once per year, inspect for: Excessive wear or cracks in pins, bearings, shafts, gears, followers, and locking and clamping devices. Surface or volumetric NDT shall be used to validate the existence or absence of cracks indicated by this inspection.	S	I	I	Mgmt			
NASA STD 8719.9	09.4.5.c	41484	Inspection: Periodic Inspection. These inspections shall be performed at varying intervals, depending on activity, severity of service, environment, and criticality: Other Inspections. When wire ropes or chains are replaced or hooks repaired, a proof load test of the hook, rope, or chain shall be performed prior to use. (Requirement 41484)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.6	41485	Inspection: Idle and Standby Personnel Lifting Devices. Idle and standby personnel lifting devices shall be inspected prior to first use according to the requirements of paragraphs 9.4.4 and 9.4.5 unless these monthly and annual inspections were performed at required intervals and recorded during the idle/standby period. (Requirement 41485)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.7(1)	41486	Inspection: Inspection Reports. After each formal periodic inspection, qualified authorized personnel shall prepare written, dated, and signed inspection reports, including procedure reference and adequacy of components. (Requirement 41486)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.7(2)	41487	Inspection: Inspection Reports: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41487)	S	I	I	Mgmt			
NASA STD 8719.9	09.4.7(3)	41488	Inspection: Inspection Reports: These reports shall be filed and be made readily available by the organizational element responsible for personnel lift inspection. (Requirement 41488)	S	I	I	Mgmt			
NASA STD 8719.9	09.5(1)	41489	Maintenance: A maintenance program based on manufacturers' recommendations, integrating proactive, reactive, preventive and predictive maintenance shall be established to increase the probability the personnel lifting device will function in the required manner over its design life cycle with a minimum of maintenance.	S	I	I	Mgmt			
NASA STD 8719.9	09.5(2)	41490	Maintenance: The program shall include procedures and a scheduling system for normal periodic maintenance items, adjustments, replacements, and repairs.	S	I	I	Mgmt			
NASA STD 8719.9	09.5(3)	41491	Maintenance: The program also shall ensure that records are kept and unsafe test and inspection discrepancies are documented and corrected.	S	I	I	Mgmt			
NASA STD 8719.9	09.5(4)	41492	Maintenance: The need to replace wire rope or chain shall be determined by a certified or otherwise qualified person based on an evaluation of inspection results. Any of the signs of deterioration and damage provided in paragraphs 9.4.5.a and 9.4.5.b are sufficient reasons for questioning continued use (see Wire Rope Users Manual for additional information on wire rope inspections).	S	I	I	Mgmt			
NASA STD 8719.9	09.5(5)	41493	Maintenance: Any personnel lifting device found in an unsafe operating condition shall be tagged out and removed from service until repaired. (Requirement 41493)	S	I	I	Mgmt			
NASA STD 8719.9	09.5(6)	41494	Maintenance: All repairs shall be made by qualified personnel in accordance with the manufacturers' instruction.	S	I	I	Mgmt			
NASA STD 8719.9	09.6(1)	41495	Personnel Certification: Operators shall be trained and certified before operating a personnel lifting device.	S	I	I	Mgmt			
NASA STD 8719.9	09.6(2)	41496	Personnel Certification: A training, examination, and licensing program shall be established or made available.	S	I	I	Mgmt			
NASA STD 8719.9	09.6(3)	41497	Personnel Certification: For those NASA installations that do not have a training program, all personnel lifting device operators shall be trained and certified by a recognized certification organization that normally performs this function.	S	I	I	Mgmt			
NASA STD 8719.9	09.6(4)	41498	Personnel Certification: The basic certification program will include the following: (Requirement 41498)	S	I	I	Mgmt			
NASA STD 8719.9	09.6.1.a	41500	Personnel Certification: The basic certification program will include the following: Training: Classroom training in safety, lifting equipment emergency procedures, general performance standards, requirements, pre-operational checks, and safety-related defects and symptoms (for initial certification and as needed).	S	I	I	Mgmt			
NASA STD 8719.9	09.6.1.b	41501	Personnel Certification: The basic certification program will include the following: Training: Hands-on training (for initial certification and as needed).	S	I	I	Mgmt			
NASA STD 8719.9	09.6.1.c	41502	Personnel Certification: The basic certification program will include the following: Training: An annual review of items in paragraphs 9.6.1.a and 9.6.2.b above. (This may be conducted informally by local supervisory personnel.)	S	I	I	Mgmt			
NASA STD 8719.9	09.6.2.a	41504	Personnel Certification: The basic certification program will include the following: Examination: Physical examination (criteria to be determined by the cognizant medical official).	S	I	I	Mgmt			
NASA STD 8719.9	09.6.2.b	41505	Personnel Certification: The basic certification program will include the following: Examination: Written examination.	S	I	I	Mgmt			
NASA STD 8719.9	09.6.2.c	41506	Personnel Certification: The basic certification program will include the following: Examination: Operational demonstration (for initial certification only).	S	I	I	Mgmt			
NASA STD 8719.9	09.6.2.d	41507	Personnel Certification: The basic certification program will include the following: Examination: Proficiency examination for recertification.	S	I	I	Mgmt			
NASA STD 8719.9	09.6.3(1)	41508	Personnel Certification: The basic certification program will include the following: Licensing. An organizational element shall be designated to issue operator licenses.	S	I	I	Mgmt			
NASA STD 8719.9	09.6.3(2)	41509	Personnel Certification: The basic certification program will include the following: Licensing. Provisions shall be made to revoke licenses for negligence, violations of safety requirements, or failure to meet medical standards.	S	I	I	Mgmt			
NASA STD 8719.9	09.6.3(3)	41510	Personnel Certification: The basic certification program will include the following: Licensing. Provisions shall be made for periodic checks of operators to verify they have licenses in their possession.	S	I	I	Mgmt			
NASA STD 8719.9	09.6.3(4)	41511	Personnel Certification: The basic certification program will include the following: Licensing. The licenses shall indicate the type of personnel lifting device the holder is qualified to operate.	S	I	I	Mgmt			

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NASA STD 8719.9	09.6.3(5)	41512	Personnel Certification: The basic certification program will include the following: Licensing. Alternately, the organizational element may elect to maintain a master list of licensed operators instead of issuing individual licenses, providing copies of the list are readily available to assurance and supervisory personnel at the work site.	S	I	I	Mgmt			
NASA STD 8719.9	09.6.4	41513	Personnel Certification: The basic certification program will include the following: Renewal. Licenses or certifications will expire at least every 4 years. Renewal procedures will be established by each licensing organization, but as a minimum, will include items in paragraphs 9.6.1 and 9.6.2.	S	I	I	Mgmt			
NASA STD 8719.9	09.7(1)	41514	Operations: Hoist support personnel lifting devices shall be operated according to applicable industry standards, government requirements, and manufacturers' instructions.	S	I	I	Mgmt			
NASA STD 8719.9	09.7(2)	41515	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: (Requirement 41515)	S	I	I	Mgmt			
NASA STD 8719.9	09.7.a	41516	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Determine that the proposed personnel lifting operation is either the least hazardous method or the only method available to position personnel so that an operation can be accomplished.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.b	41517	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Before use, the operator shall have read and understood the manufacturer's operating instructions and safety rules, have been trained and licensed according to paragraph 9.6, and have read and understood all decals and warnings on the device.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.c(1)	41518	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Before use, the operator shall inspect the personnel lifting device per the daily inspection requirements.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.c(2)	41519	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: The operator shall perform a pre-operational check to demonstrate operational readiness.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.c(3)	41520	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: If controls do not operate properly, the operator is responsible for notifying the supervisor.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.c(4)	41521	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Repairs and adjustments shall be made before operations begin.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.c(5)	41522	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: The operator shall adhere to all tags placed on the controls.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.d(1)	41523	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Before the personnel lifting device is used, the operator shall survey the area for applicable hazards such as overhead obstructions and high-voltage conductors, debris, bumps and loose obstructions, dropoffs and holes, ditches, untamped earth fills, obstructed path of travel, unstable footing, and other possible hazardous conditions.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.d(2)	41524	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: The operator shall establish appropriate safety zones before initiating operations.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.e(1)	41525	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Detailed technical operating procedures describing personnel lifting device operation, emergency steps, communication requirements, and special requirements shall be prepared. There must be a formal system for review, approval, and update to maintain valid operating procedures. (Requirement 41525)	S	I	I	Mgmt			
NASA STD 8719.9	09.7.e(2)	41526	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Emergency procedures shall be developed for contingency actions such as power loss, brake failure, or other emergencies.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.f	41527	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: A personnel lifting device shall not be loaded beyond its rated load (capacity) except for required testing.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.g	41528	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: The operator shall ensure that the personnel lifting device is within inspection and testing intervals by examination of the periodic recertification tags and documentation.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.h(1)	41529	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Necessary clothing and personnel belongings shall be stored so as not to interfere with access or operations.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.h(2)	41530	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Tools, oil can, waste, extra fuses, and other necessary articles shall be stored properly, and shall not be permitted to lie loose during the personnel lift.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.h(3)	41531	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Operators shall be familiar with the operation and care of the fire extinguishers provided.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.i(1)	41532	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Prior to an operation, personnel lifting device operators shall test the communication system.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.i(2)	41533	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Operation shall stop immediately upon communication loss and shall not continue until communication is restored.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.j(1)	41534	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Operator discipline shall be maintained at all times.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.j(2)	41535	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: There shall be no eating, drinking, or rowdiness during personnel lifting operations.	S	I	I	Mgmt			

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NASA STD 8719.9	09.7.j(3)	41536	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Personnel shall keep all parts of the body, tools, and equipment inside the work platform periphery during raising, lowering, and traveling operations.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.k	41537	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Fall protection is required for personnel using personnel lifting devices. Where possible, personnel should tie off to approved attachment points not on the work cage. Handrails shall not be used as an attachment point.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.L(1)	41538	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Personnel required to hold onto a moving platform shall use both hands.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.L(2)	41539	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Tools and other objects shall be carried in canvas bags or by other methods that free both hands and do not present a snagging hazard.	S	I	I	Mgmt			
NASA STD 8719.9	09.7.L(3)	41540	Operations: The following practices shall be followed for hoist supported personnel lifting device operations: Alternate methods of tool delivery beside personnel lifting devices should be investigated.	S	I	I	Mgmt			
NASA STD 8719.9	10.2.1(1)	41545	Safety and Design Aspects: Design Criteria that should be emphasized during sling design are contained in the documents listed in Section 2. Sling design shall be in accordance with industry standards and meet the applicable requirements of OSHA and ASME.	S	I	I	Mgmt			
NASA STD 8719.9	10.2.1(2)	41546	Safety and Design Aspects: Sling design shall maintain the minimum design factors listed in Table 10-1. Table 10-1, Minimum Design Factors for Slings. Equipment, Design Load Safety Factor. Alloy Steel Chain Slings, 5. Wire Rope Slings, 5. Metal Mesh Slings, 5. Synthetic Rope Slings, 5. Synthetic Web Slings, 5. Linear Fiber Slings, 5. Structural Slings, Lesser of 3 times yield or 5 times ultimate. Shackles, D-rings, Turnbuckles, Eye Bolts, Lifting Lugs, Safety Hoist Rings, etc., 5. Note: Design factor based on ultimate material strength, except for structural slings.	S	I	I	Mgmt			
NASA STD 8719.9	10.2.2	41547	Safety and Design Aspects: Labeling/Tagging of Slings. Certification/recertification tags are required as described in paragraph 10.3.5. A system shall be developed to identify slings used in critical lift applications. Completely assembled slings that have the necessary design features and maintenance/inspection, and test intervals to lift critical loads will be marked conspicuously so that the operator and assurance personnel can distinguish that the sling is qualified for critical lifts. (Requirement 41547)	S	I	I	Mgmt			
NASA STD 8719.9	10.3(1)	41548	Testing: The following proof load and periodic load tests apply to slings except as noted in paragraph 10.3.3. Turnbuckles shall be tested at the open position as a minimum. It is recommended that turnbuckles be tested at the open, closed, and midway positions. (Requirement 41548)	S	I	I	Mgmt			
NASA STD 8719.9	10.3(2)	41549	Testing: These tests shall be performed by qualified personnel according to written (specific or general) technical operating procedures. The acceptable tolerance for load test accuracy is +5/-0 percent.	S	I	I	Mgmt			
NASA STD 8719.9	10.3(3)	41550	Testing: When slings are composed of major components that fall into more than one of the categories listed in Table 10-2, the components shall be tested individually according to applicable requirements and then as a system to the lowest test value (if practical).	S	I	I	Mgmt			
NASA STD 8719.9	10.3(4)	41551	Testing: An inspection shall be performed after each load test and prior to release for service to ensure there is no damage. A periodic load test requirement can be fulfilled by a concurrent proof load test.	S	I	I	Mgmt			
NASA STD 8719.9	10.3(5)	41552	Testing: The load shall be held for a minimum of 3 minutes for load tests. (Requirement 41552)	S	I	I	Mgmt			
NASA STD 8719.9	10.3.1(1)	41553	Testing: Proof Load Test. Before first use, all new, extensively modified, repaired, or altered slings shall undergo a proof load test at a specified factor of the rated load according to Table 10-2. Proof load tests performed by the manufacturer prior to delivery are acceptable, if the necessary load test papers are provided to verify the extent and thoroughness of the test on the specific item. A proof load test also may be performed at a prescribed time when there is a question in design or previous testing. (Requirement 41553)	S	I	I	Mgmt			
NASA STD 8719.9	10.3.1(2)	41554	Testing: Proof Load Test: All components shall be tested together as a system, if practical.	S	I	I	Mgmt			
NASA STD 8719.9	10.3.1(3)	41555	Testing: Proof Load Test: Prior to first use, all lifting interfaces such as eyebolts, D-rings, and lifting lugs permanently attached to the load shall be proof load tested if feasible. For lifting interfaces, when deemed unfeasible by the responsible design organization and accepted by the user organization, based on possible overloading of structural members not required during lifting or other considerations, this proof load test can be eliminated. (Requirement 41555)	S	I	I	Mgmt			
NASA STD 8719.9	10.3.1(4)	41556	Testing: Proof Load Test: However, design analysis and inspection shall be used to verify the integrity of the interface. Table 10-2, Proof Load Test Factors (Based on Manufacturers' Rated Load). Equipment, Proof Load Test Factor. Alloy Steel Chain Slings, 2.0. Wire Rope Slings, 2.0. Metal Mesh Slings, 2.0. Synthetic Rope Slings, 2.0. Synthetic Web Slings, 2.0. Linear Fiber Slings, 2.0. Structural Slings, 2.0. Shackles, D-rings, Turnbuckles, Eye Bolts, Lifting Lugs, Safety Hoist Rings, etc., 2.0. "Unless otherwise specified by design, due to material characteristics, geometry, design factors, etc., but in any case, at least 125 percent of the sling's rated capacity.	S	I	I	Mgmt			
NASA STD 8719.9	10.3.2(1)	41557	Testing: Periodic Load Test. Slings shall undergo periodic load tests at least every 4 years at a specific load test factor of the design rated load as given in Table 10-3.	S	I	I	Mgmt			
NASA STD 8719.9	10.3.2(2)	41558	Testing: Periodic Load Test: All components shall be tested together as a system, if practical.	S	I	I	Mgmt			
NASA STD 8719.9	10.3.2(3)	41559	Testing: Periodic Load Test: Slings used for critical lifts shall be load tested at least once per year.	S	I	I	Mgmt			

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NASA STD 8719.9	10.3.2(4)	41560	Testing: Periodic Load Test: Slings used infrequently for critical lifts shall be load tested before each critical lift if it has been over a year since the last load test. Lifting interfaces such as eyebolts, D-rings, and lifting lugs permanently attached to the load are exempt from periodic load testing. Table 10-3 Periodic Load Test Factors (Based on Manufacturers' Rated Load), Equipment, Periodic Load Test Factor. Alloy Steel Chain Slings, 1.00. Wire Rope Slings, 1.00. Metal Mesh Slings, 1.00. Synthetic Rope Slings, 1.00*. Synthetic Web Slings, 1.00. Linear Fiber Slings, 1.00. Structural Slings, 1.00. Shackles, D-rings, Turnbuckles, Eye Bolts, Lifting Lugs, Safety Hoist Rings, etc., 1.00. *Critical lift rope slings of synthetic material shall not be used beyond 50 percent of the manufacturer's rating to maintain an equivalent design factor in the load system.	S	I	I	Mgmt			
NASA STD 8719.9	10.3.3(1)	41561	Testing: Non-Load Test Slings. Due to unique design and usage requirements, a sling may be designated as a non-load test sling by the LDEM, with concurrence from the affected/responsible program/project office, the responsible safety, design engineering, systems engineering, operations, and maintenance organizations. Such slings do not require periodic load tests. Inspections shall be conducted in accordance with paragraph 10.4.	S	I	I	Mgmt			
NASA STD 8719.9	10.3.3(2)	41562	Testing: Non-Load Test Slings: This non-load test designation shall be formally documented by each installation and the sling marked accordingly to designate it as a non-load test sling.	S	I	I	Mgmt			
NASA STD 8719.9	10.3.4	41563	Testing: Sling Rated Load. Rated loads for slings shall be based on the periodic load test weight divided by the periodic load test factor (see Table 10-3). For metal mesh slings, the rated capacity will be noted for vertical basket and choker hitch configurations. For synthetic rope slings, used in noncritical lifts, a 50-percent derating for use is recommended. For synthetic rope slings used in critical lifts, a 50-percent derating is required.	S	I	I	Mgmt			
NASA STD 8719.9	10.3.5.a(1)	41565	Testing: Test Reports and Periodic Recertification Tags: Written, dated, and signed reports shall be prepared after each test. (Requirement 41565)	S	I	I	Mgmt			
NASA STD 8719.9	10.3.5.a(2)	41566	Testing: Test Reports and Periodic Recertification Tags: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41566)	S	I	I	Mgmt			
NASA STD 8719.9	10.3.5.a(3)	41567	Testing: Test Reports and Periodic Recertification Tags: These reports shall be kept on file by the owner organization for a minimum of two test cycles and shall be made readily available. (Requirement 41567)	S	I	I	Mgmt			
NASA STD 8719.9	10.3.5.b(1)	41568	Testing: Test Reports and Periodic Recertification Tags: Following the load test, all slings shall be given a permanently affixed tag identifying the equipment (part number) and stating the rated capacity based on the load test value and the next periodic load test due date or load test expiration date. (Requirement 41568)	S	I	I	Mgmt			
NASA STD 8719.9	10.3.5.b(2)	41569	Testing: Test Reports and Periodic Recertification Tags: For alloy steel chains, size, grade, and reach shall be stated along with the rated load. (Requirement 41569)	S	I	I	Mgmt			
NASA STD 8719.9	10.3.5.b(3)	41570	Testing: Test Reports and Periodic Recertification Tags: For synthetic rope slings used for critical lifts, the marked rated load shall be 50 percent of the manufacturer's rated load. (Requirement 41570)	S	I	I	Mgmt			
NASA STD 8719.9	10.3.5.b(4)	41571	Testing: Test Reports and Periodic Recertification Tags: The type of material shall also be stated. (Requirement 41571)	S	I	I	Mgmt			
NASA STD 8719.9	10.3.5.b(5)	41572	Testing: Test Reports and Periodic Recertification Tags: All load bearing components shall be traceable of the most recent load test. This may be accomplished by clearly marking/coding or tethering all components of the assembly, through configuration control, or other procedures. (NOTE: Load bearing components not traceable to load test will invalidate the load test of the whole assembly.) (Requirement 41572)	S	I	I	Mgmt			
NASA STD 8719.9	10.4.1(1)	41574	Inspection: Inspections, as described below, shall be performed on all slings.	S	I	I	Mgmt			
NASA STD 8719.9	10.4.1(2)	41575	Inspection: Inspections shall be performed according to this section, the manufacturers' recommendations, and ASME B30.9.	S	I	I	Mgmt			
NASA STD 8719.9	10.4.1(3)	41576	Inspection: Visual inspections for cracks, deformations, gouges, galling, kinks, crushed areas, corrosion, and proper configuration shall be performed each day the sling is used, prior to first use.	S	I	I	Mgmt			
NASA STD 8719.9	10.4.1(4)	41577	Inspection: An indepth inspection shall be performed annually or when a sling is suspected to have even a small loss of strength or is repaired.	S	I	I	Mgmt			
NASA STD 8719.9	10.4.1(5)	41578	Inspection: Inspections shall be performed by qualified personnel according to approved technical operating procedures.	S	I	I	Mgmt			
NASA STD 8719.9	10.4.1(6)	41579	Inspection: Inadequacies shall be documented and, if determined to be a safety hazard, tagged out and corrected prior to further use.	S	I	I	Mgmt			
NASA STD 8719.9	10.4.2	41580	Inspection: All new, extensively repaired, or modified slings shall be given a daily and a periodic inspection prior to first use. For component repair on slings, only the inspections that apply to the repaired portion need to be performed prior to first use unless a periodic inspection interval expires during the downtime (see paragraph 10.4.5). (Requirement 41580)	S	I	I	Mgmt			
NASA STD 8719.9	10.4.3(1)	41581	Inspection: Slings in regular service (used at least once a month) shall be inspected as required in paragraphs 10.4.4 and 10.4.5.	S	I	I	Mgmt			
NASA STD 8719.9	10.4.3(2)	41582	Inspection: Idle and standby slings shall be inspected according to paragraph 10.4.6.	S	I	I	Mgmt			
NASA STD 8719.9	10.4.4	41583	Inspection: Daily Inspections. These inspections shall be performed prior to first use each day the sling is used and shall include the following: (Requirement 41583)	S	I	I	Mgmt			
NASA STD 8719.9	10.4.5(1)	41586	Inspection: Periodic Inspections. The following inspections shall be performed at least once a year, unless otherwise specified below.	S	I	I	Mgmt			
NASA STD 8719.9	10.4.5(2)	41587	Inspection: Periodic Inspections: The need to replace or repair slings shall be determined by a certified or otherwise qualified person based on an evaluation of inspection results. Any discrepancy (deterioration or damage) is sufficient reason for questioning continued use of the sling (see Wire Rope Users Manual for additional information on wire rope inspections):	S	I	I	Mgmt			
NASA STD 8719.9	10.4.5.e.6	41617	Inspection: Periodic Inspections: The following inspections shall be performed at least once a year, unless otherwise specified below: Synthetic Web and Linear Fiber Slings: Perform all inspections provided for by the sling manufacturer. This may include red fibers used as a wear indicator, or a fiber optic sling damage indicator, or some other NDT method designed into the sling.	S	I	I	Mgmt			

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NASA STD 8719.9	10.4.5.g	41632	Inspection: Periodic Inspections: The following inspections shall be performed at least once a year, unless otherwise specified below: Rejected Slings. All slings rejected during inspection shall be marked. An engineering assessment will be made to determine if the sling is repairable. Non-repairable slings will be destroyed as soon as possible to avoid unintentional use.	S	I	I	Mgmt			
NASA STD 8719.9	10.4.6	41633	Inspection: Idle and Standby Slings. Idle and standby slings shall be inspected prior to first use according to the requirements in paragraphs 10.4.4 and 10.4.5 unless these daily and periodic inspections were performed at required intervals during the idle/standby period. (Requirement 41633)	S	I	I	Mgmt			
NASA STD 8719.9	10.4.7(1)	41634	Inspection: Inspection Reports. Written, dated, and signed inspection reports shall be prepared after each periodic inspection. (Requirement 41634)	S	I	I	Mgmt			
NASA STD 8719.9	10.4.7(2)	41635	Inspection: Inspection Reports: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41635)	S	I	I	Mgmt			
NASA STD 8719.9	10.4.7(3)	41636	Inspection: Inspection Reports: These reports shall be filed and made readily available by the organizational element responsible for inspecting sling(s). (Requirement 41636)	S	I	I	Mgmt			
NASA STD 8719.9	10.5(1)	41637	Inspection: Maintenance. A maintenance program based on manufacturers' recommendations, integrating proactive, reactive, preventive, and predictive maintenance shall be established to increase the probability the sling will function in the required manner over its design life cycle with a minimum of maintenance.	S	I	I	Mgmt			
NASA STD 8719.9	10.5(2)	41638	Inspection: Maintenance: The program shall include procedures and a scheduling system for normal periodic maintenance items, adjustments, replacements, and repairs.	S	I	I	Mgmt			
NASA STD 8719.9	10.5(3)	41639	Inspection: Maintenance: The program shall also ensure that records are kept and unsafe test and inspection discrepancies are documented and corrected.	S	I	I	Mgmt			
NASA STD 8719.9	10.5(4)	41640	Inspection: Maintenance: Any sling found in an unsafe operating condition shall be tagged out and removed from service until repaired. (Requirement 41640)	S	I	I	Mgmt			
NASA STD 8719.9	10.5(5)	41641	Inspection: Maintenance: All repairs shall be made by qualified personnel in accordance with the manufacturers' instructions.	S	I	I	Mgmt			
NASA STD 8719.9	10.5(6)	41642	Inspection: Maintenance: The need to repair or replace slings shall be determined by a certified or otherwise qualified person based on an evaluation of inspection results.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.1(1)	41644	Personnel Certification: Program. Only certified (licensed) and trained riggers are authorized to perform rigging tasks for lifting devices, equipment, and/or operations. A comprehensive training, examination, and licensing program shall be established or made available. For those NASA installations/initiatives or sponsored programs and activities that do not have a training program, these requirements may be provided by a third party that is proficient in the principles of rigging. The rigging certification program will be reviewed at least annually to assure that the contents, training material, testing, and examination elements are up-to-date with current methods and techniques; and that any "lessons-learned" are adequately addressed.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.1(2)	41645	Personnel Certification: Program: Personnel performing NDT shall be qualified and certified in accordance with paragraph 1.9.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.1(3)	41646	Personnel Certification: Program: Training shall be provided to observers and flagmen.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.1(4)	41647	Personnel Certification: Program: All participants in the lifting operation shall have clearly defined roles and responsibilities.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2(1)	41648	Personnel Certification: The certification program for rigging operations shall include the following and may be included in the operator training for the individual lifting device training and certification.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2(2)	41649	Personnel Certification: If the general rigging is included in the specific lifting device certification and training program, sufficient rigging details shall be included in the training, testing and "hands-on" examination portion of that lifting device training program to assure that each individual understands and demonstrates proficiency in the required rigging techniques and methods.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2(3)	41650	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." (Requirement 41650)	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2.a.1	41652	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." Training: Classroom training in rigging safety, techniques, and methods, pre-use inspection, slings, and attachment devices (for initial certification and as needed).	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2.a.2	41653	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." Training: Hands-on training (for initial certification and as needed).	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2.a.3	41654	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." Training: An annual review by supervision or other designated personnel of each individual's performance as a rigger or operator/rigger to assure adequate proficiency in performing the necessary rigging tasks in a manner consistent with the principals, methods, and techniques associated with safe rigging practices.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2.b.1	41656	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." Examination: Physical examination (criteria to be determined by the cognizant medical official based upon the related requirements associated with performing rigging tasks).	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2.b.2	41657	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." Examination: Written examination.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2.b.3	41658	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." Examination: Operational (practical) demonstration test (for initial certification only or to address new techniques or methods as required). Each individual shall demonstrate the ability to adequately determine and/or apply load weight, center of gravity and apply special articulating devices essential to the safe and successful lift operation. Riggers must demonstrate the ability to apply proper rigging principals, methods, and techniques using simulated loads of various weights, sizes, and configurations.	S	I	I	Mgmt			

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NASA STD 8719.9	10.6.2.c.1(1)	41660	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." Rigger Licensing/Certification: An organization element shall be designated to issue rigger licenses/certifications.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2.c.1(2)	41661	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." Rigger Licensing/Certification: Provisions shall be made to suspend/revoke licenses or certifications for violation of safety requirements, failure to meet medical requirements, or acts of negligence in rigging.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2.c.1(3)	41662	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." Rigger Licensing/Certification: A program element to assure current rigger certification status of persons performing rigging tasks shall be established and implemented. The method of licensing is the responsibility of the organization element that is designated to issue the rigger licenses/certifications. Generally this will involve the use of "License/Certification Cards" issued to each individual or maintaining a master list of licensed/certified riggers that is readily available to assurance and supervisory personnel.	S	I	I	Mgmt			
NASA STD 8719.9	10.6.2.c.2	41663	Personnel Certification: The following shall be addressed in the qualification of individuals for "rigging certification." Rigger Licensing/Certification: Renewal of all rigger licenses/certifications shall require demonstration of proficiency or approval of supervision that proficiency is adequate and current. Licenses/certifications will expire at least every 4 years. Renewal procedures and requirements will be established by the organizational element responsible for issuing rigger licenses/certifications and will include those requirements established in paragraphs 10.6.2 a. and 10.6.2 b.	S	I	I	Mgmt			
NASA STD 8719.9	10.7(1)	41664	Operations. Slings shall be operated according to this section, the manufacturers' recommendations, and ASME B30.9.	S	I	I	Mgmt			
NASA STD 8719.9	10.7(2)	41665	Operations: The following practices shall be followed for sling operations: (Requirement 41665)	S	I	I	Mgmt			
NASA STD 8719.9	10.7.a	41666	Operations: The following practices shall be followed for sling operations: Select a sling of suitable rated capacity, use proper hitch, and attach the sling securely to the load. For critical lifts, rope slings of synthetic construction shall not be used beyond 50 percent of their rated load. (The minimum design factors for determining rated load are provided in Table 10-1.)	S	I	I	Mgmt			
NASA STD 8719.9	10.7.e	41670	Operations: The following practices shall be followed for sling operations: Slings shall be shortened only by methods approved by the sling manufacturer or a qualified person.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.f	41671	Operations: The following practices shall be followed for sling operations: Eyes in wire rope bridles, slings, or bull wires shall not be formed by wire rope clips or knots.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.g	41672	Operations: The following practices shall be followed for sling operations: The following materials and techniques shall not be used in slings or rigging hardware to hoist personnel or loads: natural rope, wire rope clips, the fold back metal pressed sleeve or clip technique.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.i	41674	Operations: The following practices shall be followed for sling operations: Slings shall not be loaded beyond rated load except for required testing.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.j(1)	41675	Operations: The following practices shall be followed for sling operations: Particular attention shall be given to preventing corrosion.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.j(2)	41676	Operations: The following practices shall be followed for sling operations: Slings shall be stored such that they will not be damaged by moisture, heat, sunlight, or chemicals.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.j(3)	41677	Operations: The following practices shall be followed for sling operations: Nylon shall not be used in an acid or phenolic environment.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.j(4)	41678	Operations: The following practices shall be followed for sling operations: Polyester, polypropylene, and aluminum shall not be used in a caustic environment.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.k(1)	41679	Operations: The following practices shall be followed for sling operations: Precautions shall be taken to ensure proper sling assembly and that the proper configuration is maintained.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.k(2)	41680	Operations: The following practices shall be followed for sling operations: Slings shall be used according to design and/or manufacturers' instructions.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.L	41681	Operations: The following practices shall be followed for sling operations: The user shall ensure that the sling is within the inspection and periodic recertification intervals and that all load bearing components are traceable to the most recent load test by examination of the tags and/or documentation.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.m	41682	Operations: The following practices shall be followed for sling operations: Sling repair shall maintain the minimum design factors based on ultimate material strength. These factors are listed in Table 10-1.	S	I	I	Mgmt			
NASA STD 8719.9	10.7.n	41683	Operations: The following practices shall be followed for sling operations: Slings shall be padded or protected from the sharp edges of their loads.	S	I	I	Mgmt			
NASA STD 8719.9	11.2.1	41689	Safety and Design Aspects: Design criteria/general design requirements that should be emphasized for mobile aerial platforms are contained in ANSI/SIA A92.2, A92.3, A92.5, and A92.6. It is the responsibility of the applicable engineering, operations/maintenance, and safety organizations to ensure the design, testing, maintenance, inspection, and operation of this equipment complies with this standard, the manufacturers' recommendations, and ANSI/SIA.	S	I	I	Mgmt			
NASA STD 8719.9	11.2.2.a	41691	Safety and Design Aspects: Labeling/Tagging of Mobile Aerial Platforms: The rated load/applicable capacity ratings shall be clearly marked on the mobile aerial platform.	S	I	I	Mgmt			
NASA STD 8719.9	11.2.2.b	41692	Safety and Design Aspects: Labeling/Tagging of Mobile Aerial Platforms: A standard system of labeling shall be established and used throughout the installation.	S	I	I	Mgmt			
NASA STD 8719.9	11.2.2.c	41693	Safety and Design Aspects: Labeling/Tagging of Mobile Aerial Platforms: A standard lockout/tagout system shall be established and used throughout the installation to indicate equipment that is not to be used due to inspection discrepancies, ongoing maintenance, or other reasons.	S	I	I	Mgmt			
NASA STD 8719.9	11.2.3(1)	41695	Safety and Design Aspects: Safety Analysis and Documentation of Mobile Aerial Platforms. A recognized safety hazard analysis such as fault tree analysis, FMEA, O&SHA shall be performed on all mobile aerial platforms used for lifts where failure/loss of control could result in loss of or damage to flight hardware.	S	I	I	Mgmt			

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NASA STD 8719.9	11.2.3(2)	41696	Safety and Design Aspects: Safety Analysis and Documentation of Mobile Aerial Platforms: The analysis shall, as a minimum, determine potential sources of danger, identify failure modes, and recommend resolutions and a system of risk acceptance for those conditions found in the hardware-facility-environment-human relationship that could cause loss of life, personal injury, and loss of or damage to the mobile aerial platform, facility, or load.	S	I	I	Mgmt			
NASA STD 8719.9	11.2.3(3)	41697	Safety and Design Aspects: Safety Analysis and Documentation of Mobile Aerial Platforms: The analysis shall be done as part of the initial activation process, included in the equipment documentation, and updated as required to reflect any changes in operation and/or configuration.	S	I	I	Mgmt			
NASA STD 8719.9	11.3(1)	41698	Testing: Testing of mobile aerial platforms shall be performed according to this section, the manufacturers' recommendations, and the applicable ANS/SIA standard. Three types of tests are required for mobile aerial platforms: proof load tests, periodic load tests, and operational tests.	S	I	I	Mgmt			
NASA STD 8719.9	11.3(2)	41699	Testing: Proof load tests and operational tests shall be performed prior to first use for new or extensively repaired or altered components directly in the mobile aerial platform load path. Repairs or alterations to nonlifting or nonholding components do not require a load test, although a functional check should be performed to determine if the repairs or alterations are acceptable. (Requirement 41699)	S	I	I	Mgmt			
NASA STD 8719.9	11.3(3)	41700	Testing: The periodic load and operational tests shall be performed annually. The acceptable tolerance for load test accuracy is +5/-0 percent. (Requirement 41700)	S	I	I	Mgmt			
NASA STD 8719.9	11.3(4)	41701	Testing: All load and operational tests shall be performed by qualified personnel according to written (specific or general) technical operating procedures.	S	I	I	Mgmt			
NASA STD 8719.9	11.3(5)	41702	Testing: An inspection of the mobile aerial platform and its components shall be performed after each load test and prior to the platform being released for service to ensure there is no damage. The periodic load test requirement may be fulfilled by a concurrently performed proof load test. (Requirement 41702)	S	I	I	Mgmt			
NASA STD 8719.9	11.3.1(1)	41703	Testing: Proof Load Test. Before first use, all new, extensively repaired, or altered mobile aerial platforms shall undergo a proof load test in accordance with the manufacturers' instructions and the applicable ANSI/SIA standard. A proof load test may also be performed when there is a question in design, previous testing, or to ensure system integrity. (Requirement 91355)	S	I	I	Mgmt			
NASA STD 8719.9	11.3.1(2)	41704	Testing: Proof Load Test: The load shall be lifted slowly in an area where minimal damage will occur if the platform fails. (Requirement 41704)	S	I	I	Mgmt			
NASA STD 8719.9	11.3.2	41705	Testing: Periodic Load Test. Each mobile aerial platform shall be tested at least once every year with a load equal to the rated load. (Requirement 41705)	S	I	I	Mgmt			
NASA STD 8719.9	11.3.3	41706	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: (Requirement 41706)	S	I	I	Mgmt			
NASA STD 8719.9	11.3.4(1)	41710	Testing: Test Reports and Periodic Recertification Tags. After each test, designated personnel shall prepare written, dated, and signed test reports. (Requirement 41710)	S	I	I	Mgmt			
NASA STD 8719.9	11.3.4(2)	41711	Testing: Test Reports and Periodic Recertification Tags: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41711)	S	I	I	Mgmt			
NASA STD 8719.9	11.3.4(3)	41712	Testing: Test Reports and Periodic Recertification Tags: These reports shall be kept on file for a minimum of two test cycles and shall be made readily available. (Requirement 41712)	S	I	I	Mgmt			
NASA STD 8719.9	11.3.4(4)	41713	Testing: Test Reports and Periodic Recertification Tags: Following the periodic load test, mobile aerial platforms shall be given a permanently affixed tag identifying the equipment and stating the next required periodic load test date or load test expiration date. (Requirement 41713)	S	I	I	Mgmt			
NASA STD 8719.9	11.4.1(1)	41715	Inspection: Inspections, as described below, shall be performed on all mobile aerial platforms.	S	I	I	Mgmt			
NASA STD 8719.9	11.4.1(2)	41716	Inspection: Inspections shall be performed according to this section, the manufacturers' recommendations, and the applicable ANSI/SIA standard.	S	I	I	Mgmt			
NASA STD 8719.9	11.4.1(3)	41717	Inspection: Inadequacies discovered during an inspection shall be documented and, if determined to be a hazard, tagged out and corrected prior to further use. (Requirement 41717)	S	I	I	Mgmt			
NASA STD 8719.9	11.4.1(4)	41718	Inspection: Inspections shall be performed by qualified personnel according to approved technical operating procedures.	S	I	I	Mgmt			
NASA STD 8719.9	11.4.2	41719	Inspection: All new, extensively repaired, or modified mobile aerial platforms shall be inspected to the requirements of both daily and periodic inspections prior to first use. For component repair on mobile aerial platforms, only the inspections that apply to the repaired portion need to be performed prior to first use unless a periodic inspection interval expires during the downtime (see paragraph 11.4.5).	S	I	I	Mgmt			
NASA STD 8719.9	11.4.3(1)	41720	Inspection: Mobile aerial platforms in regular service (used at least once a month) shall be inspected as required in paragraphs 11.4.4 and 11.4.5.	S	I	I	Mgmt			
NASA STD 8719.9	11.4.3(2)	41721	Inspection: Idle and standby platforms shall be inspected according to paragraph 11.4.6.	S	I	I	Mgmt			
NASA STD 8719.9	11.4.4	41722	Inspection: Daily Inspections. These inspections shall be performed each day the mobile aerial platform is used and shall include the following: (Requirement 41722)	S	I	I	Mgmt			
NASA STD 8719.9	11.4.5(1)	41729	Inspection: Periodic Inspections. These inspections shall be performed at varying intervals depending on activity, severity of service, and environment.	S	I	I	Mgmt			
NASA STD 8719.9	11.4.5(2)	41730	Inspection: Periodic Inspections: The following inspections shall be performed at least once per year or more frequently if required by the manufacturer or the applicable ANSI/SIA standard. Inspect for: (Requirement 41730)	S	I	I	Mgmt			
NASA STD 8719.9	11.4.6	41744	Inspection: Idle and Standby Mobile Aerial Platforms. Idle and standby mobile aerial platforms shall be inspected prior to first use according to the requirements of paragraphs 11.4.4 and 11.4.5 unless these daily and periodic inspections were performed at required intervals and recorded during the idle/standby period. (Requirement 41744)	S	I	I	Mgmt			
NASA STD 8719.9	11.4.7(1)	41745	Inspection: Inspection Reports. After each formal periodic inspection, qualified personnel shall prepare written, dated, and signed inspection reports, including procedure reference and adequacy of components. (Requirement 41745)	S	I	I	Mgmt			
NASA STD 8719.9	11.4.7(2)	41746	Inspection: Inspection Reports: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41746)	S	I	I	Mgmt			



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NASA STD 8719.9	11.4.7(3)	41747	Inspection: Inspection Reports: These reports shall be filed and be made readily available by the organizational element responsible for mobile aerial platforms. (Requirement 41747)	S	I	I	Mgmt			
NASA STD 8719.9	11.5(1)	41748	Maintenance: A maintenance program based on manufacturers' recommendations, integrating proactive, reactive, preventive and predictive maintenance shall be established to increase the probability the mobile aerial platform will function in the required manner over its design life cycle with a minimum of maintenance.	S	I	I	Mgmt			
NASA STD 8719.9	11.5(2)	41749	Maintenance: The program shall include procedures and a scheduling system for normal periodic maintenance items, adjustments, replacements, and repairs.	S	I	I	Mgmt			
NASA STD 8719.9	11.5(3)	41750	Maintenance: The program also shall ensure that records are kept and unsafe test and inspection discrepancies are documented and corrected.	S	I	I	Mgmt			
NASA STD 8719.9	11.5(4)	41751	Maintenance: Any mobile aerial platform found in an unsafe operating condition shall be removed from service until repaired.	S	I	I	Mgmt			
NASA STD 8719.9	11.5(5)	41752	Maintenance: All repairs shall be made by qualified personnel in accordance with the manufacturers' instructions.	S	I	I	Mgmt			
NASA STD 8719.9	11.6(1)	41753	Personnel Certification: Only certified (licensed) and trained operators shall be authorized to operate mobile aerial platforms (except for manually propelled platforms where training can be provided).	S	I	I	Mgmt			
NASA STD 8719.9	11.6(2)	41754	Personnel Certification: A training, examination, and licensing program shall be established or made available.	S	I	I	Mgmt			
NASA STD 8719.9	11.6(3)	41755	Personnel Certification: For those NASA installations that do not have a training program, all mobile aerial platform operators shall be trained and certified by a recognized certification organization that normally performs this function. The basic certification program will include the following: (Requirement 41755)	S	I	I	Mgmt			
NASA STD 8719.9	11.6.1.a	41757	Personnel Certification: The basic certification program will include the following: Training: Classroom training in safety, lifting equipment emergency procedures, general performance standards, requirements, pre-operational checks, and safety-related defects and symptoms (for initial certification and as needed).	S	I	I	Mgmt			
NASA STD 8719.9	11.6.1.b	41758	Personnel Certification: The basic certification program will include the following: Training: Hands-on training (for initial certification and as needed).	S	I	I	Mgmt			
NASA STD 8719.9	11.6.1.c	41759	Personnel Certification: The basic certification program will include the following: Training: An annual review of items listed in paragraphs 11.6.1.a and 11.6.1.b above. (This may be conducted informally by local supervisory personnel).	S	I	I	Mgmt			
NASA STD 8719.9	11.6.1.d	41760	Personnel Certification: The basic certification program will include the following: Training: Training for working at heights and the proper use of fall protection equipment.	S	I	I	Mgmt			
NASA STD 8719.9	11.6.2.a	41762	Personnel Certification: The basic certification program will include the following: Examination: Physical examination (criteria to be determined by the cognizant medical official).	S	I	I	Mgmt			
NASA STD 8719.9	11.6.2.b	41763	Personnel Certification: The basic certification program will include the following: Examination: Written/oral examination.	S	I	I	Mgmt			
NASA STD 8719.9	11.6.2.c	41764	Personnel Certification: The basic certification program will include the following: Examination: Operational demonstration.	S	I	I	Mgmt			
NASA STD 8719.9	11.6.2.d	41765	Personnel Certification: The basic certification program will include the following: Examination: Proficiency examination for recertification.	S	I	I	Mgmt			
NASA STD 8719.9	11.6.3(1)	41766	Personnel Certification: The basic certification program will include the following: Licensing: An organizational element shall be designated to issue operator licenses.	S	I	I	Mgmt			
NASA STD 8719.9	11.6.3(2)	41767	Personnel Certification: The basic certification program will include the following: Licensing: Provisions shall be made to revoke licenses for negligence, violations of safety requirements, or failure to meet medical standards.	S	I	I	Mgmt			
NASA STD 8719.9	11.6.3(3)	41768	Personnel Certification: The basic certification program will include the following: Licensing: Provisions shall be made for periodic checks of operators to verify they have licenses in their possession.	S	I	I	Mgmt			
NASA STD 8719.9	11.6.3(4)	41769	Personnel Certification: The basic certification program will include the following: Licensing: The licenses shall indicate the type of mobile aerial platform the holder is qualified to operate. Alternately, the organizational element may elect to maintain a master list of licensed operators instead of issuing individual licenses, providing copies of the list are readily available to assurance and supervisory personnel at the work site.	S	I	I	Mgmt			
NASA STD 8719.9	11.6.4	41770	Personnel Certification: The basic certification program will include the following: Renewal. Licenses or certifications will expire at least every 4 years. Renewal shall require demonstration of proficiency or approval of supervision that proficiency is adequate and current. Renewal procedures will be established by each licensing organization, but as a minimum, will include items in paragraphs 11.6.1 and 11.6.2.	S	I	I	Mgmt			
NASA STD 8719.9	11.7(1)	41771	Operations: Mobile aerial platforms shall be operated according to this section, the manufacturers' recommendations, and the applicable ANSI/SIA standard.	S	I	I	Mgmt			
NASA STD 8719.9	11.7(2)	41772	Operations: The following practices shall be followed for mobile aerial platform operations: (Requirement 41772)	S	I	I	Mgmt			
NASA STD 8719.9	11.7.b	41774	Operations: The following practices shall be followed for mobile aerial platform operations: Before each use, the operator shall have read and understood the manufacturer's operating instructions and safety rules, have been trained and licensed according to paragraph 11.6, and have read and understood all decals and warnings on the equipment.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.c(1)	41775	Operations: The following practices shall be followed for mobile aerial platform operations: Before each use, the operator shall perform a pre-operational check to demonstrate operational readiness, including all limit switches and outrigger drift switches, if applicable, but excluding the tilt alarm/shutoff. If controls do not operate properly, the operator is responsible for notifying the supervisor.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.c(2)	41776	Operations: The following practices shall be followed for mobile aerial platform operations: Repairs and adjustments shall be made before operations begin.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.c(3)	41777	Operations: The following practices shall be followed for mobile aerial platform operations: The operator shall adhere to all tags on the controls.	S	I	I	Mgmt			

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NASA STD 8719.9	11.7.d(1)	41778	Operations: The following practices shall be followed for mobile aerial platform operations: Before each use, the operator shall survey the area for applicable hazards such as overhead obstructions and high-voltage conductors, debris, bumps and loose obstructions, dropoffs and holes, ditches, untamped earth fills, obstructed path of travel, unstable footing, and other possible hazardous conditions.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.d(2)	41779	Operations: The following practices shall be followed for mobile aerial platform operations: The operator shall establish appropriate safety zones before initiating operations.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.e	41780	Operations: The following practices shall be followed for mobile aerial platform operations: The equipment shall not be loaded beyond its rated load (capacity) except for required testing.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.f	41781	Operations: The following practices shall be followed for mobile aerial platform operations: The operator shall ensure the equipment is within inspection and testing intervals by examination of the periodic recertification tags and/or documentation.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.g(1)	41782	Operations: The following practices shall be followed for mobile aerial platform operations: Operator discipline shall be maintained at all times.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.g(2)	41783	Operations: The following practices shall be followed for mobile aerial platform operations: There shall be no eating, drinking, or rowdiness during mobile aerial platform operations.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.g(3)	41784	Operations: The following practices shall be followed for mobile aerial platform operations: Personnel shall keep all parts of the body, tools, and equipment inside the work platform periphery during raising, lowering, and traveling operations.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.i	41786	Operations: The following practices shall be followed for mobile aerial platform operations: Tools and other objects shall be carried in canvas bags or by other methods that free both hands and do not present a snagging hazard. Alternate methods of tool delivery beside mobile aerial platforms should be investigated.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.j	41787	Operations: The following practices shall be followed for mobile aerial platform operations: For work on or near electrical distribution and transmission lines, mobile aerial platforms shall be operated in accordance with paragraphs 5.7.as, 5.7.at, and 5.7.au, of this standard and the applicable ANSI/SIA standard.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.k	41788	Operations: The following practices shall be followed for mobile aerial platform operations: Insulated mobile aerial platforms shall be tested and inspected in accordance with ANSI/SIA.	S	I	I	Mgmt			
NASA STD 8719.9	11.7.L	41789	Operations: The following practices shall be followed for mobile aerial platform operations: Outdoor mobile aerial platform operations should not commence if winds are above 20 knots steady state (23 mph, 37 km/hr) or if gusts exceed 25 knots (29 mph, 46 km/hr) or as recommended by the manufacturer. Consideration shall also be given to weather conditions such as lightning or snow before commencing operations.	S	I	I	Mgmt			
NASA STD 8719.9	12.2.2.a	41796	Safety and Design Aspects: Labeling/Tagging of Powered Industrial Trucks: The rated load/applicable capacity ratings shall be clearly marked on the powered industrial truck. (Requirement 41796)	S	I	I	Mgmt			
NASA STD 8719.9	12.2.2.b	41797	Safety and Design Aspects: Labeling/Tagging of Powered Industrial Trucks: A standard system of labeling shall be established and used throughout the installation.	S	I	I	Mgmt			
NASA STD 8719.9	12.2.2.c	41798	Safety and Design Aspects: Labeling/Tagging of Powered Industrial Trucks: A standard lockout/tagout system shall be established and used throughout the installation to indicate equipment that is not to be used due to inspection discrepancies, ongoing maintenance, mishaps or other reason.	S	I	I	Mgmt			
NASA STD 8719.9	12.2.3(1)	41800	Safety and Design Aspects: Safety Analysis and Documentation of Powered Industrial Trucks: A recognized safety hazard analysis such as fault tree analysis, FMEA, O&SHA shall be performed on all powered industrial trucks used for lifts where failure/loss of control could result in loss of or damage to flight hardware.	S	I	I	Mgmt			
NASA STD 8719.9	12.2.3(2)	41801	Safety and Design Aspects: Safety Analysis and Documentation of Powered Industrial Trucks: The analysis shall, as a minimum, determine potential sources of danger, identify failure modes, and recommend resolutions and a system of risk acceptance for those conditions found in the hardware-facility-environment-human relationship that could cause loss of life, personal injury, and loss of or damage to the powered industrial truck, facility, or load.	S	I	I	Mgmt			
NASA STD 8719.9	12.2.3(3)	41802	Safety and Design Aspects: Safety Analysis and Documentation of Powered Industrial Trucks: The analysis shall be done as part of the initial activation process, included in the equipment documentation, and updated as required to reflect any changes in operation and/or configuration.	S	I	I	Mgmt			
NASA STD 8719.9	12.3(1)	41803	Testing: Testing of powered industrial trucks shall be performed according to this section, the manufacturers' recommendations, and the applicable OSHA and ASME standards. Three types of tests are required for powered industrial trucks: proof load tests, periodic load tests, and operational tests.	S	I	I	Mgmt			
NASA STD 8719.9	12.3(2)	41804	Testing: All load and operational tests shall be performed by qualified personnel according to written (specific or general) technical operating procedures.	S	I	I	Mgmt			
NASA STD 8719.9	12.3(3)	41805	Testing: An inspection of the powered industrial truck and its components shall be performed after each load test and prior to the truck being released for service to ensure there is no damage. The acceptable tolerance for load test accuracy is +5/-0 percent unless otherwise specified. The periodic load test requirement may be fulfilled by a concurrently performed proof load test. (Requirement 41805)	S	I	I	Mgmt			
NASA STD 8719.9	12.3.1	41806	Testing: Proof Load Test. Proof load tests and operational tests shall be performed prior to first use for new or extensively repaired or altered components directly in the powered industrial truck load path in accordance with the manufacturers' instruction and the applicable ASME standard. Repairs or alterations to non-lifting or non-holding components do not require a load test, although a functional check should be performed to determine if the repairs or alterations are acceptable. A proof load test may also be performed when there is a question in design, previous testing, or to ensure system integrity. (Requirement 41806)	S	I	I	Mgmt			
NASA STD 8719.9	12.3.2	41807	Testing: Periodic Load Test. For powered industrial trucks used where failure/loss of control could result in loss of or damage to flight hardware, a periodic load and operational test shall be performed at least once every year with a load equal to the rated load. (Requirement 41807)	S	I	I	Mgmt			

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NASA STD 8719.9	12.3.3	41808	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: (Requirement 41808)	S	I	I	Mgmt			
NASA STD 8719.9	12.3.3.a	41809	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: Perform all functions in a loaded condition including tilt operation. Ensure the load is secured and will not move during tilting operations.	S	I	I	Mgmt			
NASA STD 8719.9	12.3.3.c	41811	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: The operational test for a modified powered industrial truck can be tailored to test only those portions of the equipment that were modified/repared only if the rated and operational test interval has not expired.	S	I	I	Mgmt			
NASA STD 8719.9	12.3.4(1)	41812	Testing: Test Reports and Periodic Recertification Tags. After each test, designated personnel shall prepare written, dated, and signed test reports. (Requirement 41812)	S	I	I	Mgmt			
NASA STD 8719.9	12.3.4(2)	41813	Testing: Test Reports and Periodic Recertification Tags: Inadequacies shall be documented and, if determined to be a hazard corrected prior to further use. (Requirement 41813)	S	I	I	Mgmt			
NASA STD 8719.9	12.3.4(3)	41814	Testing: Test Reports and Periodic Recertification Tags: These reports shall be kept on file for a minimum of two test cycles and shall be made readily available. (Requirement 41814)	S	I	I	Mgmt			
NASA STD 8719.9	12.3.4(4)	41815	Testing: Test Reports and Periodic Recertification Tags: Following the periodic load test, powered industrial trucks shall be given a permanently affixed tag identifying the equipment and stating the next required periodic load test date or load test expiration date. (Requirement 41815)	S	I	I	Mgmt			
NASA STD 8719.9	12.4.1(1)	41817	Inspection: Inspections shall be performed on all powered industrial trucks.	S	I	I	Mgmt			
NASA STD 8719.9	12.4.1(2)	41818	Inspection: Inspections shall be performed according to this section, the manufacturers' recommendations, and ASME B56.1.	S	I	I	Mgmt			
NASA STD 8719.9	12.4.1(3)	41819	Inspection: Inadequacies discovered during an inspection shall be documented and, if determined to be a hazard, the truck will be tagged out and the inadequacy corrected prior to further use. (Requirement 41819)	S	I	I	Mgmt			
NASA STD 8719.9	12.4.1(4)	41820	Inspection: Inspections shall be performed by qualified personnel according to approved technical operating procedures.	S	I	I	Mgmt			
NASA STD 8719.9	12.4.2	41821	Inspection: All new, extensively repaired, or modified powered industrial trucks shall be inspected to the requirements of both daily and periodic inspections prior to first use. For component repair on powered industrial trucks, only the inspections that apply to the repaired portion need to be performed prior to first use unless a periodic inspection interval expires during the downtime (see paragraph 12.4.5). (Requirement 41821)	S	I	I	Mgmt			
NASA STD 8719.9	12.4.3(1)	41822	Inspection: Powered industrial trucks in regular service (used at least once a month) shall be inspected as required in paragraphs 12.4.4 and 12.4.5. (Requirement 41822)	S	I	I	Mgmt			
NASA STD 8719.9	12.4.3(2)	41823	Inspection: Idle and standby powered industrial trucks shall be inspected according to paragraph 12.4.6. (Requirement 41823)	S	I	I	Mgmt			
NASA STD 8719.9	12.4.4	41824	Inspection: Daily Inspections. These inspections shall be performed by the operator prior to each shift the truck is used. Inspect: (Requirement 41824)	S	I	I	Mgmt			
NASA STD 8719.9	12.4.5	41840	Inspection: Periodic Inspections. The following inspections shall be performed at least once per year or more frequently as required by the manufacturer, ASME B56.1, users' experience gained, severity of service, environment, and criticality. Inspect: (Requirement 41840)	S	I	I	Mgmt			
NASA STD 8719.9	12.4.6	41849	Inspection: Idle and Standby Powered Industrial Trucks. Idle and standby powered industrial trucks shall be inspected prior to first use according to the requirements of paragraphs 12.4.4 and 12.4.5 unless these daily and periodic inspections were performed at required intervals and recorded during the idle/standby period. (Requirement 41849)	S	I	I	Mgmt			
NASA STD 8719.9	12.4.7(1)	41850	Inspection: Inspection Reports. After each formal periodic inspection, qualified personnel shall prepare written, dated, and signed inspection reports, including procedure reference and adequacy of components. (Requirement 41850)	S	I	I	Mgmt			
NASA STD 8719.9	12.4.7(2)	41851	Inspection: Inspection Reports: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 41851)	S	I	I	Mgmt			
NASA STD 8719.9	12.4.7(3)	41852	Inspection: Inspection Reports: These reports shall be filed and be made readily available by the organizational element responsible for powered industrial trucks. (Requirement 41852)	S	I	I	Mgmt			
NASA STD 8719.9	12.5(1)	41853	Maintenance: A maintenance program based on manufacturers' recommendations, integrating proactive, reactive, preventive, and predictive maintenance shall be established to increase the probability the powered industrial truck will function in the required manner over its design life cycle with a minimum of maintenance.	S	I	I	Mgmt			
NASA STD 8719.9	12.5(2)	41854	Maintenance: The program shall include procedures and a scheduling system for normal periodic maintenance items, adjustments, replacements, and repairs.	S	I	I	Mgmt			
NASA STD 8719.9	12.5(3)	41855	Maintenance: The program also shall ensure that records are kept and unsafe test and inspection discrepancies are documented and corrected.	S	I	I	Mgmt			
NASA STD 8719.9	12.5(4)	41856	Maintenance: Any powered industrial truck found in an unsafe operating condition shall be tagged out and removed from service until repaired. (Requirement 41856)	S	I	I	Mgmt			
NASA STD 8719.9	12.5(5)	41857	Maintenance: All repairs shall be made by qualified personnel in accordance with the manufacturers' instructions.	S	I	I	Mgmt			
NASA STD 8719.9	12.5.1	41858	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are made, the following safety precautions shall be taken: (Requirement 41858)	S	I	I	Mgmt			
NASA STD 8719.9	12.5.1.a	41859	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are made, the following safety precautions shall be taken: Move the powered industrial truck to a designated area where maintenance activities will not interfere with other operations and there is proper ventilation.	S	I	I	Mgmt			
NASA STD 8719.9	12.5.1.b	41860	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are made, the following safety precautions shall be taken: When lifting trucks for repair, trucks shall be lifted in a safe, secure, stable manner. The drive wheels will be raised free of the floor or the battery will be disconnected.	S	I	I	Mgmt			

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NASA STD 8719.9	12.5.1.c	41861	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are made, the following safety precautions shall be taken: Chocks or other positive truck positioning devices will be used.	S	I	I	Mgmt			
NASA STD 8719.9	12.5.1.h	41866	Maintenance: Maintenance Procedures. Before maintenance, adjustments, repairs, and replacements are made, the following safety precautions shall be taken: The charger connector shall be plugged only into the battery connector and never into the truck connector.	S	I	I	Mgmt			
NASA STD 8719.9	12.5.2	41867	Maintenance: Adjustments. Based upon the manufacturers documentation and/or experience gained, adjustments shall be made to ensure that all powered industrial trucks function properly, paying particular attention to: (Requirement 41867)	S	I	I	Mgmt			
NASA STD 8719.9	12.5.3.a	41875	Maintenance: Repair/Replacement: Modifications and additions that affect truck capacity (to include addition of counterweight) and safe truck operation shall not be performed without manufacturer approval.	S	I	I	Mgmt			
NASA STD 8719.9	12.5.3.b	41876	Maintenance: Repair/Replacement: Replacement parts, including tires, shall be interchangeable with the original parts and of a quality at least equal to that provided in the original equipment. (Requirement 41876)	S	I	I	Mgmt			
NASA STD 8719.9	12.5.3.d	41878	Maintenance: Repair/Replacement: No repairs shall be made in Class I, II, and III locations (ref. OSHA 1910.178).	S	I	I	Mgmt			
NASA STD 8719.9	12.5.3.e	41879	Maintenance: Repair/Replacement: Replacement batteries shall be of the service weight that falls within the minimum/maximum range specified on the truck nameplate by the truck manufacturer. (Requirement 41879)	S	I	I	Mgmt			
NASA STD 8719.9	12.6(1)	41880	Personnel Certification: Only certified (licensed) and trained operators shall be authorized to operate powered industrial trucks.	S	I	I	Mgmt			
NASA STD 8719.9	12.6(2)	41881	Personnel Certification: A training, examination, and licensing program shall be established or made available.	S	I	I	Mgmt			
NASA STD 8719.9	12.6(3)	41882	Personnel Certification: For those NASA installations that do not have a training program, all powered industrial truck operators shall be trained and certified by a recognized certification organization that normally performs this function. The basic certification program will include the following: (Requirement 41882)	S	I	I	Mgmt			
NASA STD 8719.9	12.6.1.a	41884	Personnel Certification: The basic certification program will include the following: Training: Classroom training in safety, lifting equipment emergency procedures, general performance standards, requirements, pre-operational checks, and safety-related defects and symptoms (for initial certification and as needed).	S	I	I	Mgmt			
NASA STD 8719.9	12.6.1.b	41885	Personnel Certification: The basic certification program will include the following: Training: Hands-on training (for initial certification and as needed).	S	I	I	Mgmt			
NASA STD 8719.9	12.6.1.c	41886	Personnel Certification: The basic certification program will include the following: Training: An annual review of items listed in paragraphs 12.6.1a and 12.6.1.b above. (This may be conducted informally by local supervisory personnel.)	S	I	I	Mgmt			
NASA STD 8719.9	12.6.2.a	41888	Personnel Certification: The basic certification program will include the following: Examination: Physical examination (criteria to be determined by the cognizant medical official and should comply with ASME B56.1).	S	I	I	Mgmt			
NASA STD 8719.9	12.6.2.b	41889	Personnel Certification: The basic certification program will include the following: Examination: Written/oral examination.	S	I	I	Mgmt			
NASA STD 8719.9	12.6.2.c	41890	Personnel Certification: The basic certification program will include the following: Examination: Operational demonstration.	S	I	I	Mgmt			
NASA STD 8719.9	12.6.2.d	41891	Personnel Certification: The basic certification program will include the following: Examination: Proficiency examination for recertification.	S	I	I	Mgmt			
NASA STD 8719.9	12.6.3(1)	41892	Personnel Certification: Licensing: An organizational element shall be designated to issue operator licenses/certifications.	S	I	I	Mgmt			
NASA STD 8719.9	12.6.3(2)	41893	Personnel Certification: Licensing: Provisions shall be made to revoke licenses/certifications for negligence, violations of safety requirements, or failure to meet medical standards.	S	I	I	Mgmt			
NASA STD 8719.9	12.6.3(3)	41894	Personnel Certification: Licensing: Provisions shall be made for periodic checks of operators to verify they have licenses in their possession.	S	I	I	Mgmt			
NASA STD 8719.9	12.6.3(4)	41895	Personnel Certification: Licensing: The licenses shall indicate the type of powered industrial truck the holder is qualified to operate. Alternately, the organizational element may elect to maintain a master list of licensed operators instead of issuing individual licenses, providing copies of the list are readily available to assurance and supervisory personnel at the work site. (Requirement 41895)	S	I	I	Mgmt			
NASA STD 8719.9	12.6.4(1)	41896	Personnel Certification: Renewal: Licenses or certifications will expire every 3 years. (Requirement 41896)	S	I	I	Mgmt			
NASA STD 8719.9	12.6.4(2)	41897	Personnel Certification: Renewal: Renewal shall require demonstration of proficiency or approval of supervision that proficiency is adequate and current. Renewal procedures will be established by each licensing organization, but as a minimum, will include items in paragraphs 12.6.1 and 12.6.2. Renewal or refresher training will be provided to operators within the three year certification period when: (Requirement 41897)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1(1)	41904	Operations: Powered industrial trucks shall be operated according to this section, the manufacturers' recommendations, and ASME B56.1.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1(2)	41905	Operations: The following practices shall be followed for powered industrial truck operations: (Requirement 41905)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.a	41906	Operations: The following practices shall be followed for powered industrial truck operations: General operating procedures describing powered industrial truck operations, emergency steps, communication requirements, and special requirements including checklists and inspection requirements shall be prepared, approved and followed for each area powered industrial truck operations are performed and shall include each type of truck. There must be a formal system for review approval, and update to maintain valid operating procedures.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.aa	41907	Operations: The following practices shall be followed for powered industrial truck operations: Industrial trucks shall not be parked where they block access to fire aisles, stairways, or fire equipment. (Requirement 41907)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.ab	41908	Operations: The following practices shall be followed for powered industrial truck operations: Motorized hand trucks shall not be ridden unless they are of the hand/rider design.	S	I	I	Mgmt			

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NASA STD 8719.9	12.7.1.ac.10	41919	Operations: The following practices shall be followed for powered industrial truck operations: Whenever a truck is used to lift personnel and there are no controls that are elevatable with the lifting carriage or forks: Restraining means such as rails or chains shall be in place and personnel on the platform shall wear a body harness and lanyard or retractable safety device.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.ac.11	41920	Operations: The following practices shall be followed for powered industrial truck operations: Whenever a truck is used to lift personnel and there are no controls that are elevatable with the lifting carriage or forks: Personnel on the platform shall be certified in Fall Protection.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.ad	41921	Operations: The following practices shall be followed for powered industrial truck operations: Whenever a truck is used to lift personnel and there are no controls that are elevatable with the lifting carriage or forks: While refueling, the engine shall be stopped and the operator shall not be on the truck. (Requirement 41921)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.ae	41922	Operations: The following practices shall be followed for powered industrial truck operations: Whenever a truck is used to lift personnel and there are no controls that are elevatable with the lifting carriage or forks: Spillage of oil or fuel shall be carefully and completely absorbed or evaporated and fuel tank cap replaced before restarting engine.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.af	41923	Operations: The following practices shall be followed for powered industrial truck operations: Whenever a truck is used to lift personnel and there are no controls that are elevatable with the lifting carriage or forks: Open flames shall not be used to check electrolyte levels in storage batteries, liquid level in fuel tanks, or the condition of LPG fuel lines and connectors.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.b(1)	41924	Operations: The following practices shall be followed for powered industrial truck operations: Operations shall be analyzed for hazards.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.b(2)	41925	Operations: The following practices shall be followed for powered industrial truck operations: The analysis shall consider the environment in which the operation occurs, hazards associated with lift truck maintenance, and, in general, a systems safety analysis of the equipment, facility, load, and interfaces as a whole in support of the lift truck operation.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.c(1)	41926	Operations: The following practices shall be followed for powered industrial truck operations: Before each operation or series of operations, the operator shall perform a pre-operational check to demonstrate operational readiness of the truck. If controls do not operate properly, the operator is responsible for notifying the supervisor. (Requirement 41926)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.c(2)	41927	Operations: The following practices shall be followed for powered industrial truck operations: Repairs and adjustments shall be made before operations begin. (Requirement 41927)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.d(1)	41928	Operations: The following practices shall be followed for powered industrial truck operations: Before each use, the operator shall survey the area for applicable hazards such as overhead obstructions, debris, bumps and loose obstructions, drop-offs and holes, ditches, obstructed path of travel, unstable ground, and other possible hazardous conditions.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.d(2)	41929	Operations: The following practices shall be followed for powered industrial truck operations: The operator shall establish appropriate safety zones before initiating operations. (Requirement 41929)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.e	41930	Operations: The following practices shall be followed for powered industrial truck operations: The equipment shall not be loaded beyond its rated load (capacity) except for required testing. (Requirement 41930)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.f(1)	41931	Operations: The following practices shall be followed for powered industrial truck operations: The operator shall ensure the equipment is within inspection and testing intervals by examination of the periodic recertification tags and/or documentation.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.f(2)	41932	Operations: The following practices shall be followed for powered industrial truck operations: The operator shall adhere to all tags on the controls. (Requirement 41932)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.g(1)	41933	Operations: The following practices shall be followed for powered industrial truck operations: Operator discipline shall be maintained at all times.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.g(2)	41934	Operations: The following practices shall be followed for powered industrial truck operations: There shall be no eating, drinking, or rowdiness during powered industrial truck operations.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.h	41935	Operations: The following practices shall be followed for powered industrial truck operations: Operators shall keep all parts of the body inside the operator compartment during operations.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.k	41938	Operations: The following practices shall be followed for powered industrial truck operations: Trucks shall not be driven up to anyone standing in front of an object.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.L	41939	Operations: The following practices shall be followed for powered industrial truck operations: Operators shall ensure other personnel are not in the swing radius prior to performing turning maneuvers.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.m	41940	Operations: The following practices shall be followed for powered industrial truck operations: Operators shall sound the horn when approaching cross aisles, doorways and other locations where pedestrians may step into the path of truck travel.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.o(1)	41942	Operations: The following practices shall be followed for powered industrial truck operations: Unauthorized personnel shall not be permitted to ride on powered industrial trucks.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.o(2)	41943	Operations: The following practices shall be followed for powered industrial truck operations: A safe place to ride shall be provided where riding of trucks is authorized.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.r	41946	Operations: The following practices shall be followed for powered industrial truck operations: Before leaving the operator's position or dismounting from the truck, while still attending the truck, the operator shall: (Requirement 41946)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.s	41953	Operations: The following practices shall be followed for powered industrial truck operations: The operator shall maintain a safe distance from the edge of ramps, platforms and other similar working surfaces.	S	I	I	Mgmt			

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NASA STD 8719.9	12.7.1.t	41954	Operations: The following practices shall be followed for powered industrial truck operations: When powered industrial trucks are driven on and off highway trucks or trailers, the brakes on the highway trucks or trailers shall be applied and wheels chocked or other positive mechanical means shall be used to prevent unintentional truck or trailer movement. Fixed jacks should be placed under trailers not coupled to a tractor.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.u(1)	41955	Operations: The following practices shall be followed for powered industrial truck operations: Provision shall be made to prevent railroad cars from being moved during loading and unloading.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.u(2)	41956	Operations: The following practices shall be followed for powered industrial truck operations: Wheel stops, hand brakes, or other recognized positive means shall be used to prevent movement of the railroad cars.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.v	41957	Operations: The following practices shall be followed for powered industrial truck operations: Operators shall verify sufficient headroom under overhead installations, lights, wiring, pipes, sprinkler systems, or other.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.w	41958	Operations: The following practices shall be followed for powered industrial truck operations: An overhead guard shall be used to protect against falling objects. (Requirement 41958)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.x	41959	Operations: The following practices shall be followed for powered industrial truck operations: A load backrest shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.y	41960	Operations: The following practices shall be followed for powered industrial truck operations: Only approved industrial trucks shall be used in areas classified as hazardous locations.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.1.z	41961	Operations: The following practices shall be followed for powered industrial truck operations: All accidents involving personnel, building structures, and equipment shall be reported to the supervisor. (Requirement 41961)	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.a	41963	Operations: Traveling of Powered Industrial Trucks: Truck operators shall observe all traffic regulations including posted speed limits.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.b	41964	Operations: Traveling of Powered Industrial Trucks: Truck operators shall yield the right of way to pedestrians and emergency vehicles such as ambulances and fire trucks.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.c	41965	Operations: Traveling of Powered Industrial Trucks: Truck operators shall not pass another truck traveling in the same direction at intersections, blind spots, or other dangerous locations.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.d	41966	Operations: Traveling of Powered Industrial Trucks: Operators shall slow down and sound the horn, or audible warning device, at cross aisles and other locations where their view is obstructed.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.e	41967	Operations: Traveling of Powered Industrial Trucks: Railroad tracks will be crossed at an angle and trucks will not be parked closer than 6 feet to the nearest rail of a railroad track.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.f	41968	Operations: Traveling of Powered Industrial Trucks: Truck operators shall keep a clear view of the path of travel and observe for other traffic, personnel, and safe clearances.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.g	41969	Operations: Traveling of Powered Industrial Trucks: If the load being carried obstructs forward travel, the operator will travel with the load trailing.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.h	41970	Operations: Traveling of Powered Industrial Trucks: Truck operators shall ascend and descend grades slowly, with caution and by the following operations:	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.h.1	41971	Operations: Traveling of Powered Industrial Trucks: Truck operators shall ascend and descend grades slowly, with caution and by the following operations: Loaded rider trucks shall be driven with the load up grade when ascending or descending grades in excess of 5%.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.h.3	41973	Operations: Traveling of Powered Industrial Trucks: Truck operators shall ascend and descend grades slowly, with caution and by the following operations: On all grades the loads and load engaging means shall be tilted back and raised only as far as necessary to clear the road surface.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.i	41975	Operations: Traveling of Powered Industrial Trucks: Trucks shall be operated at a speed that will permit it to be brought to a stop in a safe manner.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.j	41976	Operations: Traveling of Powered Industrial Trucks: The truck shall be operated with the load engaging means or load low and where possible tilted back. The load should not be elevated except during stacking.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.k	41977	Operations: Traveling of Powered Industrial Trucks: Starts, stops, turns, or direction reversals shall be in a smooth manner so as not to shift the load or overturn the truck.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.L	41978	Operations: Traveling of Powered Industrial Trucks: Horseplay and stunt driving will not be allowed.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.m	41979	Operations: Traveling of Powered Industrial Trucks: Operators will slow down for wet and slippery surfaces.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.n	41980	Operations: Traveling of Powered Industrial Trucks: Before driving over a dockboard or bridge plate, operators shall be sure it is properly secure and its rated capacity is not exceeded and shall drive across carefully and slowly.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.o	41981	Operations: Traveling of Powered Industrial Trucks: Operators shall avoid running over loose objects on the roadway surface.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.p	41982	Operations: Traveling of Powered Industrial Trucks: Operators shall reduce speed to a safe level when negotiating turns and shall reduce speed to be consistent with the environment.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.q	41983	Operations: Traveling of Powered Industrial Trucks: Seat belts, when provided, shall be used.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.2.r	41984	Operations: Traveling of Powered Industrial Trucks: The operator should stay with the truck if tipover occurs or if the truck falls off a loading dock or ramp. The operator should hold on firmly and lean away from the point of impact.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.3.d	41989	Operations: Loading Powered Industrial Trucks: When attachments are used, extra care shall be taken in securing, manipulating, positioning, and transporting the load.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.3.e	41990	Operations: Loading Powered Industrial Trucks: Trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load.	S	I	I	Mgmt			
NASA STD 8719.9	12.7.3.f	41991	Operations: Loading Powered Industrial Trucks: Loads shall be completely engaged with the load engaging means. Forks should be at least 2/3 of the load length.	S	I	I	Mgmt			

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NASA STD 8719.9	13.2.1	41998	Safety and Design Aspects: Design criteria/general design requirements for jacks are contained in ASME B30.1. It is the responsibility of the applicable engineering, operations/maintenance, and safety organizations to ensure the design, testing, maintenance, inspection, and operation of this equipment complies with this standard, the manufacturers' recommendations, and ASME B30.1.	S	I	I	Mgmt			
NASA STD 8719.9	13.2.1.a	41999	Safety and Design Aspects: Control parts shall be designed to provide a means of operation and adjustment, which will minimize exposure of the operator to injury. (Requirement 41999)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.1.b(1)	42000	Safety and Design Aspects: Jack construction shall incorporate a positive stop or method to prevent over travel. (Requirement 42000)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.1.b(2)	42001	Safety and Design Aspects: The over travel prevention (or stop) shall not alter the operating characteristics of the jack.	S	I	I	Mgmt			
NASA STD 8719.9	13.2.2.a	42003	Safety and Design Aspects: Labeling/Tagging of Jacks: The rated load/applicable capacity ratings shall be clearly and permanently marked on the jack. (Requirement 42003)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.2.b	42004	Safety and Design Aspects: Labeling/Tagging of Jacks: Mechanical jacks with two ratings (sustaining and lifting) shall be so marked. (Requirement 42004)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.2.c	42005	Safety and Design Aspects: Labeling/Tagging of Jacks: Hydraulic pressure or lever arm length and force shall be legibly marked on the jack. (Requirement 42005)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.2.d	42006	Safety and Design Aspects: Labeling/Tagging of Jacks: Marking shall indicate the recommended hydraulic fluid to be used. (Requirement 42006)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.2.e	42007	Safety and Design Aspects: Labeling/Tagging of Jacks: Double acting hydraulic jacks shall be marked to indicate the need for a relief valve. (Requirement 42007)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.2.f	42008	Safety and Design Aspects: Labeling/Tagging of Jacks: A standard system of labeling shall be established and used throughout the installation. (Requirement 42008)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.2.g	42009	Safety and Design Aspects: Labeling/Tagging of Jacks: A standard lockout/tagout system shall be established and used throughout the installation to indicate equipment that is not to be used due to inspection discrepancies, ongoing maintenance, or other reasons. (Requirement 42009)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.2.h	42010	Safety and Design Aspects: Labeling/Tagging of Jacks: Certification/recertification are required as described in paragraph 13.3.4. (Requirement 42010)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.3(1)	42011	Safety and Design Aspects: Safety Analysis and Documentation of Jacks. A recognized safety hazard analysis such as fault tree analysis, FMEA, O&SHA shall be performed on all jacks used for lifts where failure/loss of control could result in loss of or damage to flight hardware. (Requirement 42011)	S	I	I	Mgmt			
NASA STD 8719.9	13.2.3(2)	42012	Safety and Design Aspects: Safety Analysis and Documentation of Jacks: The analysis shall, as a minimum, determine potential sources of danger, identify failure modes, and recommend resolutions and a system of risk acceptance for those conditions found in the hardware-facility-environment-human relationship that could cause loss of life, personal injury, and loss of or damage to the jack, facility, or load.	S	I	I	Mgmt			
NASA STD 8719.9	13.2.3(3)	42013	Safety and Design Aspects: Safety Analysis and Documentation of Jacks: The analysis shall be done as part of the initial activation process, included in the equipment documentation, and updated as required to reflect any changes in operation and/or configuration. (Requirement 42013)	S	I	I	Mgmt			
NASA STD 8719.9	13.3(1)	42014	Testing: Testing of jacks shall be performed according to this section, the manufacturers' recommendations, and ASME B30.1. Three types of tests are required for jacks: proof load tests, periodic load tests, and operational tests.	S	I	I	Mgmt			
NASA STD 8719.9	13.3(2)	42015	Testing: Proof load tests and operational tests shall be performed prior to first use for new or extensively repaired or altered components directly in the jack load path. Repairs or alterations to nonlifting or nonholding components do not require a load test, although a functional check should be performed to determine if the repairs or alterations are acceptable. (Requirement 42015)	S	I	I	Mgmt			
NASA STD 8719.9	13.3(3)	42016	Testing: The periodic load and operational tests shall be performed annually. The acceptable tolerance for load test accuracy is +5/-0 percent unless otherwise specified. (Requirement 42016)	S	I	I	Mgmt			
NASA STD 8719.9	13.3(4)	42017	Testing: All load and operational tests shall be performed by qualified personnel according to written (specific or general) technical operating procedures. (Requirement 42017)	S	I	I	Mgmt			
NASA STD 8719.9	13.3(5)	42018	Testing: An inspection of the jack and its components shall be performed after each load test and prior to the jack being released for service to ensure there is no damage. The periodic load test requirement may be fulfilled by a concurrently performed proof load test. (Requirement 42018)	S	I	I	Mgmt			
NASA STD 8719.9	13.3.1(1)	42019	Testing: Proof Load Test. Before first use, all new, extensively repaired, or altered jacks shall undergo a proof load test at 120% of the rated load and operated to its full length of travel in accordance with the manufacturers' instructions and ASME B30.1. A proof load test may also be performed when there is a question in design, previous testing or to ensure system integrity. (Requirement 42019)	S	I	I	Mgmt			
NASA STD 8719.9	13.3.1(2)	42020	Testing: Proof Load Test: The load shall be lifted slowly in an area where minimal damage will occur if the jack fails. For new jacks, manufacturer documentation of performed proof load tests will be acceptable as meeting this requirement. (Requirement 42020)	S	I	I	Mgmt			
NASA STD 8719.9	13.3.2	42021	Testing: Periodic Load Test. For jacks used where failure/loss of control could result in loss of or damage to flight hardware, a periodic load and operational test shall be performed at least once every year with a load equal to the rated load. (Requirement 42021)	S	I	I	Mgmt			
NASA STD 8719.9	13.3.3	42022	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: (Requirement 42022)	S	I	I	Mgmt			
NASA STD 8719.9	13.3.3.a	42023	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: Hydraulic jacks shall be operated to full length of travel. Hold the load for a minimum of 5 minutes and verify drift does not exceed that specified by the responsible engineering organization.	S	I	I	Mgmt			

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NASA STD 8719.9	13.3.3.b	42024	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: Mechanical jacks shall be operated to full length of travel. Hold the load for a minimum of 5 minutes and verify no drift.	S	I	I	Mgmt			
NASA STD 8719.9	13.3.3.c	42025	Testing: Operational Test. Together with proof load and periodic load tests, the following shall be performed with a dummy rated load unless otherwise specified: The operational test for a modified jack can be tailored to test only those portions of the equipment that were modified/repared, only if the rated and operational test interval has not expired.	S	I	I	Mgmt			
NASA STD 8719.9	13.3.4(1)	42026	Testing: Test Reports and Periodic Recertification Tags. After each test, designated personnel shall prepare written, dated, and signed test reports. (Requirement 42026)	S	I	I	Mgmt			
NASA STD 8719.9	13.3.4(2)	42027	Testing: Test Reports and Periodic Recertification Tags: Inadequacies shall be documented and, if determined to be a hazard, corrected prior to further use. (Requirement 42027)	S	I	I	Mgmt			
NASA STD 8719.9	13.3.4(3)	42028	Testing: Test Reports and Periodic Recertification Tags: These reports shall be kept on file for a minimum of two test cycles and shall be made readily available. (Requirement 42028)	S	I	I	Mgmt			
NASA STD 8719.9	13.3.4(4)	42029	Testing: Test Reports and Periodic Recertification Tags: Following the periodic load test, jacks shall be given a permanently affixed tag identifying the equipment and stating the next required periodic load test date or load test expiration date. (Requirement 42029)	S	I	I	Mgmt			
NASA STD 8719.9	13.4.1(1)	42031	Inspection: Safety inspections shall be performed on all jacks. (Requirement 42031)	S	I	I	Mgmt			
NASA STD 8719.9	13.4.1(2)	42032	Inspection: Inspections shall be performed according to this section, the manufacturers' recommendations, and ASME B30.1.	S	I	I	Mgmt			
NASA STD 8719.9	13.4.1(3)	42033	Inspection: Inadequacies discovered during an inspection shall be documented and, if determined to be a hazard, tagged out and corrected prior to further use. (Requirement 42033)	S	I	I	Mgmt			
NASA STD 8719.9	13.4.1(4)	42034	Inspection: Inspections shall be performed by qualified personnel according to approved technical operating procedures.	S	I	I	Mgmt			
NASA STD 8719.9	13.4.2	42035	Inspection: All new, extensively repaired, or modified jacks shall be inspected to the requirements of both daily and periodic inspections prior to first use. For component repair on jacks, only the inspections that apply to the repaired portion need to be performed prior to first use unless a periodic inspection interval expires during the downtime (see paragraph 13.4.5). (Requirement 42035)	S	I	I	Mgmt			
NASA STD 8719.9	13.4.3(1)	42036	Inspection: Jacks in regular service (used at least once a month) shall be inspected as required in paragraphs 13.4.4 and 13.4.5.	S	I	I	Mgmt			
NASA STD 8719.9	13.4.3(2)	42037	Inspection: Idle and standby jacks shall be inspected according to paragraph 13.4.6.	S	I	I	Mgmt			
NASA STD 8719.9	13.4.4(1)	42038	Inspection: Daily Inspections. These inspections shall be performed each day the jack is used. Inspect for (without disassembly): (Requirement 42038)	S	I	I	Mgmt			
NASA STD 8719.9	13.4.4(2)	42052	Inspection: Daily Inspections. If external conditions indicate possible internal difficulty, notify the supervisor. Repairs and adjustments shall be made before operations begin	S	I	I	Mgmt			
NASA STD 8719.9	13.4.5(1)	42053	Inspection: Periodic Inspections. Periodic inspections are the same as paragraph 13.4.4. Periodic inspections shall be performed at least once per year or more frequently if required by the manufacturer or ASME B30.1. Periodic inspections consist of visual inspection by an appointed person and require dated documented records. If external conditions indicate possible internal difficulty, notify the supervisor. (Requirement 42053)	S	I	I	Mgmt			
NASA STD 8719.9	13.4.5(2)	42054	Inspection: Periodic Inspections: Repairs and adjustments shall be made before operations begin. (Requirement 42054)	S	I	I	Mgmt			
NASA STD 8719.9	13.4.6	42055	Inspection: Idle and Standby Jacks. Idle and standby jacks shall be inspected prior to first use according to the requirements of paragraphs 13.4.4 and 13.4.5 unless these daily and periodic inspections were performed at required intervals and recorded during the idle/standby period. (Requirement 42055)	S	I	I	Mgmt			
NASA STD 8719.9	13.5(1)	42056	Maintenance: A maintenance program based on manufacturers' recommendations, integrating proactive, reactive, preventive, and predictive maintenance shall be established to increase the probability the jack will function in the required manner over its design life cycle with a minimum of maintenance.	S	I	I	Mgmt			
NASA STD 8719.9	13.5(2)	42057	Maintenance: The program shall include procedures and a scheduling system for normal periodic maintenance items, adjustments, replacements, and repairs.	S	I	I	Mgmt			
NASA STD 8719.9	13.5(3)	42058	Maintenance: The program also shall ensure that records are kept and unsafe test and inspection discrepancies are documented and corrected.	S	I	I	Mgmt			
NASA STD 8719.9	13.5(4)	42059	Maintenance: Any jack found in an unsafe operating condition shall be removed from service, tagged out, and not used until repaired. (Requirement 42059)	S	I	I	Mgmt			
NASA STD 8719.9	13.5(5)	42060	Maintenance: All repairs shall be made by qualified personnel in accordance with the manufacturers' instructions.	S	I	I	Mgmt			
NASA STD 8719.9	13.5.1	42061	Maintenance: Only hydraulic jack fluid which is compatible with the jack manufacturer's specifications shall be used. (Requirement 42061)	S	I	I	Mgmt			
NASA STD 8719.9	13.5.5	42065	Maintenance: Replacement parts should be purchased from the original manufacturer or verified as meeting the original manufacturer requirements. A qualified person shall verify replacement parts meet manufacturer requirements and instructions.	S	I	I	Mgmt			
NASA STD 8719.9	13.5.6	42066	Maintenance: Hydraulic jacks exposed to freezing temperatures shall be supplied with an adequate anti-freeze liquid. (Requirement 42066)	S	I	I	Mgmt			
NASA STD 8719.9	13.6(1)	42067	Personnel Certification. Only qualified and designated personnel shall be authorized to perform inspection and/or maintenance operations on jacks. (Requirement 42067)	S	I	I	Mgmt			
NASA STD 8719.9	13.6(2)	42068	Personnel Certification: Operators shall be instructed in the proper use of jacks.	S	I	I	Mgmt			
NASA STD 8719.9	13.7(1)	42069	Operations. Jacks shall be operated according to this section, the manufacturers' recommendations, and ASME B30.1.	S	I	I	Mgmt			
NASA STD 8719.9	13.7(2)	42070	Operations: The following practices shall be followed for jack operations: (Requirement 42070)	S	I	I	Mgmt			



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NASA STD 8719.9	13.7.a	42071	Operations: The following practices shall be followed for jack operations: Before the jack is used each day (shift), the operator shall have read and understood the manufacturer's operating instructions and safety rules, and have read and understood all decals and warnings on the equipment.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.b(1)	42072	Operations: The following practices shall be followed for jack operations: Before the jack is used each day (shift), the operator shall perform a pre-operational check to demonstrate operational readiness, including all limit switches. If controls do not operate properly, the operator is responsible for notifying the supervisor.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.b(2)	42073	Operations: The following practices shall be followed for jack operations: Repairs and adjustments shall be made before operations begin.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.c(1)	42074	Operations: The following practices shall be followed for jack operations: Before operating the jack, the operator shall survey the area for applicable hazards such as obstructions, debris, bumps, drop-offs and holes, obstructed path of travel, unstable footing, and other possible hazardous conditions.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.c(2)	42075	Operations: The following practices shall be followed for jack operations: The operator shall establish appropriate safety zones, if required, before initiating operations.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.d	42076	Operations: The following practices shall be followed for jack operations: The equipment shall not be loaded beyond its rated load (capacity) except for required testing.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.e(1)	42077	Operations: The following practices shall be followed for jack operations: The operator shall ensure the equipment is within inspection and testing intervals by examination of the periodic load test tags and/or documentation.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.e(2)	42078	Operations: The following practices shall be followed for jack operations: The operator shall adhere to all tags on the controls.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.g	42080	Operations: The following practices shall be followed for jack operations: The jack shall be firmly supported at the base under load.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.i	42082	Operations: The following practices shall be followed for jack operations: Operators shall not straddle the operating lever of a mechanical jack.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.j	42083	Operations: The following practices shall be followed for jack operations: Operating levers shall be removed when not in use to avoid accidental dislodging of the jack and reduce the tripping hazard.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.k	42084	Operations: The following practices shall be followed for jack operations: Measures shall be taken to prevent personnel from working or passing under the load until the load is secured by cribbing, blocking, or other means.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.L	42085	Operations: The following practices shall be followed for jack operations: Precautions shall be taken to ensure all personnel are clear of the load before lowering.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.m	42086	Operations: The following practices shall be followed for jack operations: Personnel shall be instructed in the signals and procedures for multiple jack use or special jack lift operations.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.n	42087	Operations: The following practices shall be followed for jack operations: Off-center loading of jacks shall be avoided.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.o	42088	Operations: The following practices shall be followed for jack operations: Extenders shall not be used unless authorized by a qualified person.	S	I	I	Mgmt			
NASA STD 8719.9	13.7.p	42089	Operations: The following practices shall be followed for jack operations: If there is a possibility of slippage of the cap, a block shall be placed in between the cap and the load.	S	I	I	Mgmt			
NASA STD 8719.9	A.2	42092	As an alternative standard developed pursuant to Section 1-201(d) of Executive Order 12196 and 29 CFR 1960.17, it applies only to NASA employees. The Occupational Safety and Health Administration (OSHA) will inspect the working conditions of NASA employees performing these specified operations for compliance with these alternate standard requirements. Although OSHA cannot inspect private sector employees working in the same operation with NASA employees for compliance with the alternate standard, it will fully consider the equivalent safeguards specified in this standard for both NASA and contractor employees as the basis for a de minimis violation which is recorded, but not issued. (Requirement 42092)	S	I	I	Mgmt			
NASA STD 8719.9	A.4	42097	Requirements. It is recognized that cranes and hoists do not generally meet the support requirements of a system that would allow personnel to work beneath a suspended load. NASA's first hazard avoidance protocol is to design hazards out of the system or operation. Accordingly, it is NASA's intent and goal that all future systems, hardware, and equipment be engineered, designed, installed, and operated to prevent exposing employees to working under loads suspended from cranes and hoists. Due to the uniqueness of NASA activities and the limitations imposed when using present systems, hardware, equipment, and facilities, suspended load operations may be permitted only under specifically approved and controlled conditions. No suspended load operation shall be performed unless all (15) of the following special requirements are met: (Requirement 42097)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.01	42098	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: All suspended load operations will be approved by the Center/facility NASA Director of Safety based upon a detailed engineering hazards analysis of the operation. The hazards analysis will be prepared by the responsible safety organization and coordinated through appropriate engineering and design offices. The analysis documentation will include the following: (Requirement 42098)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.01.a	42099	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: All suspended load operations will be approved by the Center/facility NASA Director of Safety based upon a detailed engineering hazards analysis of the operation. The hazards analysis will be prepared by the responsible safety organization and coordinated through appropriate engineering and design offices. The analysis documentation will include the following: A justification why the operation cannot be conducted without personnel beneath the load. Feasible procedure/design options will be investigated to determine if the work can be accomplished without personnel working under a load suspended from a crane/hoist.	S	I	I	Mgmt			

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NASA STD 8719.9	A.4.01.b	42100	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: All suspended load operations will be approved by the Center/facility NASA Director of Safety based upon a detailed engineering hazards analysis of the operation. The hazards analysis will be prepared by the responsible safety organization and coordinated through appropriate engineering and design offices. The analysis documentation will include the following: Details of the precautions taken to protect personnel should the load drop. Secondary support systems, i.e., equipment designed to assume support of (catch) the load preventing injury to personnel should the crane/hoist fail, shall be evaluated and used whenever feasible. Secondary support systems will be constructed with a minimum safety factor of 2 to yield. (Requirement 42100)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.01.c	42101	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: All suspended load operations will be approved by the Center/facility NASA Director of Safety based upon a detailed engineering hazards analysis of the operation. The hazards analysis will be prepared by the responsible safety organization and coordinated through appropriate engineering and design offices. The analysis documentation will include the following: The maximum number of exposed personnel allowed. Steps shall be taken to limit the number of personnel working under a load suspended from a crane/hoist. Only those essential personnel absolutely necessary to perform the operation will be allowed to work in the safety controlled area.	S	I	I	Mgmt			
NASA STD 8719.9	A.4.01.d	42102	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: All suspended load operations will be approved by the Center/facility NASA Director of Safety based upon a detailed engineering hazards analysis of the operation. The hazards analysis will be prepared by the responsible safety organization and coordinated through appropriate engineering and design offices. The analysis documentation will include the following: The time of exposure. Steps shall be taken to ensure that personnel do not remain under the load any longer than necessary to complete the work. (Requirement 42102)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.02	42103	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Each operation will be reviewed on a case-by-case basis.	S	I	I	Mgmt			
NASA STD 8719.9	A.4.03	42104	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Only those suspended load operations approved by the Center/facility NASA Director of Safety will be permitted, subject to this standard. A list of approved suspended load operations will be maintained by NASA Safety and made available to OSHA personnel upon request.	S	I	I	Mgmt			
NASA STD 8719.9	A.4.04	42105	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: The operational procedures document (e.g., Operations and Maintenance Instruction, Technical Operating Procedure, Work Authorization Document) will be revised to specify the necessary additional requirements identified by the hazard analysis discussed in paragraph A.4.1. The procedures will be available on site for inspection during the operation.	S	I	I	Mgmt			
NASA STD 8719.9	A.4.05	42106	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: During a suspended load operation, if a new procedure not covered by the original analysis is deemed necessary due to unusual or unforeseen circumstances, the NASA Center/facility Safety Office will be consulted and must approve and document the procedure before operations continue. Safety will coordinate with Operations, Engineering, and other organizations as appropriate. If the new procedure is to be performed on a regular basis, a detailed hazards analysis and approval as outlined in paragraph A.4.1 are required.	S	I	I	Mgmt			
NASA STD 8719.9	A.4.06	42107	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: The crane/hoist shall be designed, tested, inspected, maintained, and operated in accordance with the NASA Standard for Lifting Devices and Equipment (NASA-STD-8719.9). Test, inspection, and maintenance procedures will be developed and approved by qualified, responsible NASA engineers. Qualified specialists will perform the procedures and resolve noted discrepancies. NASA Quality Assurance will perform an independent annual inspection of all cranes/hoists involved in suspended load operations. The results of the annual inspections will be maintained and made available to OSHA personnel upon request. (Requirement 42107)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.07	42108	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Each crane/hoist involved in suspended load operations shall undergo a Failure Modes and Effects Analysis (FMEA) that shall be approved by the Center/facility NASA Director of Safety. The FMEA will determine Single Failure Points (SFP), assessing all critical mechanical functional components and support systems in the drive trains and critical electrical components. (Requirement 42108)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.07.a	42109	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Each crane/hoist involved in suspended load operations shall undergo a Failure Modes and Effects Analysis (FMEA) that shall be approved by the Center/facility NASA Director of Safety. The FMEA will determine Single Failure Points (SFP), assessing all critical mechanical functional components and support systems in the drive trains and critical electrical components: For those cranes/hoists identified as having no SFP whose failure would result in dropping the load, the total weight of the suspended load shall not exceed the device's rated load. (Requirement 42109)	S	I	I	Mgmt			

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NASA STD 8719.9	A.4.07.b	42110	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Each crane/hoist involved in suspended load operations shall undergo a Failure Modes and Effects Analysis (FMEA) that shall be approved by the Center/facility NASA Director of Safety. The FMEA will determine Single Failure Points (SFP), assessing all critical mechanical functional components and support systems in the drive trains and critical electrical components: For those cranes/hoists identified as having a SFP whose failure would result in dropping the load, use of that device for suspended load operations must be approved by NASA Headquarters. Complete documentation on the suspended load operation, including the hazards analysis outlined in paragraph A.4.1 and the FMEA described above, will be forwarded to NASA Headquarters for evaluation. Approval will be given based upon detailed analysis of the potential hazards and rationale for acceptance. Such cases will never exceed the device's rated load. OSHA shall be notified when NASA Headquarters approves using any crane/hoist identified as having	S	I	I	Mgmt			
NASA STD 8719.9	A.4.08	42111	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Before lifting the load involved in a suspended load operation, the crane/hoist will undergo a visual inspection (without major disassembly) of components instrumental in assuring that the load will not be dropped (e.g., primary and secondary brake systems, hydraulics, mechanical linkages, and wire rope per NASA-STD-8719.9). Noted discrepancies will be resolved before the operation continues. This pre-lift inspection will be in addition to the inspections required in 1910.179(j) and 180(d).	S	I	I	Mgmt			
NASA STD 8719.9	A.4.09	42112	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: A trained and licensed operator (certified per NASA-STD-8719.9) shall remain at the crane/hoist controls while personnel are under the load. (Requirement 42112)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.10(1)	42113	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Safety controlled areas shall be established with appropriate barriers (rope, cones, etc.). (Requirement 42113)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.10(2)	42114	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: All nonessential personnel shall be required to remain behind the barriers. (Requirement 42114)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.11	42115	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Prior to the suspended load operation, a meeting with the crane/hoist operator(s), signal person(s), person(s) who will work under the load, and the person responsible for the task shall be held to plan and review the approved operational procedures that will be followed, including procedures for entering and leaving the safety controlled area. (Requirement 42115)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.12(1)	42116	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Communications (voice, radio, hard wired, or visual) between the operator(s), signal person(s), and the person(s) working under the load shall be maintained. (Requirement 42116)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.12(2)	42117	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Upon communication loss, operations shall stop immediately, personnel shall clear the hazardous area, and the load shall be safed. (Requirement 42117)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.12(3)	42118	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Operations shall not continue until communications are restored. (Requirement 42118)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.13	42119	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: Personnel working beneath the load shall remain in continuous sight of the operator(s) and/or the signal person(s). (Requirement 42119)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.14	42120	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: NASA shall conduct periodic reviews to ensure the continued safety of the procedures. As a minimum, NASA will annually evaluate the implementation of this procedure at each Center with operations on the suspended load list. (Requirement 42120)	S	I	I	Mgmt			
NASA STD 8719.9	A.4.15	42121	Requirements: No suspended load operation shall be performed unless all (15) of the following special requirements are met: A list of approved suspended load operations, list of cranes/hoists used for suspended load operations, and copies of the associated hazards analyses will be provided to the OSHA Office of Federal Agency Programs via NASA Headquarters for distribution to the appropriate regional and area OSHA offices. (NASA Headquarters, in conjunction with OSHA, will develop a format for transmittal of this information.) Quarterly updates to the documentation will be provided as needed.	S	I	I	Mgmt			
NPD 8700.1C	5.h	1101	RESPONSIBILITY: Supervisors and managers are responsible for educating their employees on the hazards of their job, establishing and promoting safe work practices, instilling in employees the importance of safety and mission success, and implementing safety and mission success regulations. (Requirement 1101)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8700.1C	5.i	1102	RESPONSIBILITY: Employees are responsible for understanding the safety and mission-success requirements of their organization, performing their tasks in accordance with established safety procedures, and using prescribed personal protective equipment. (Requirement 1102)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	1.b	8032	It is NASA policy to -- Meet the most protective requirements in the event of conflicting standards or regulatory issuance until a resolution of the conflicts can be accomplished. (Requirement 8032)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	1.c	8033	It is NASA policy to -- Instill an awareness of the need for safety, health, and resource conservation in all NASA employees and require NASA contractors to emphasize safety, health, and resource conservation to their employees. (Requirement 8033)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	1.d	8034	It is NASA policy to -- Establish overall safety and health objectives to ensure employee safety, health, and resource conservation during all operations. (Requirement 8034)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	1.e	8035	It is NASA policy to -- Establish safety and health management performance indicators to measure progress toward meeting safety and health objectives. (Requirement 8035)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPD 8710.2D	1.f	8036	It is NASA policy to -- Periodically review and evaluate plans, systems, programs, facilities, equipment, processes, and activities to ensure that objectives will be achieved in a safe and healthful manner. (Requirement 8036)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	1.g	8037	It is NASA policy to -- Develop and maintain a management information system(s) for tracking and advancing goals of the safety and health programs. (Requirement 8037)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	1.h	8038	It is NASA policy to -- Ensure that all alleged hazardous conditions are investigated, all identified safety and health risks are properly assessed and controlled, and pertinent close-call and lessons-learned situations are promptly publicized to prevent reoccurrences. (Requirement 8038)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	1.i	8039	It is NASA policy to -- Encourage employees to report workplace hazards and to ensure that no employee is subject to restraint, interference, coercion, discrimination, or reprisal for exercising his/her rights to report unsafe or unhealthful conditions. (Requirement 8039)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	1.j	8040	It is NASA policy to -- Reinforce NASA's commitment to safety and health, and highlight details of the Agency's safety and health programs, by periodically preparing and distributing NASA safety and health information to all NASA facilities and locations. (Requirement 8040)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	1.k	8041	It is NASA policy to -- Establish space flight awareness motivation programs within NASA and the supporting NASA contractor/partner workforce for the purpose of instilling in employees the need to prevent human errors and mistakes that could impact the safety and mission success of human space flight activities. (Requirement 8041)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	5.c	8004	The Enterprise Associate Administrators, Institutional Program Officers, and the Director for Headquarters Operations are responsible for providing the necessary management oversight, resources, and emphasis to ensure and maintain proper safety and health programs within their institutions/programs. (Requirement 8004)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	5.d(1)	8005	The Director, NASA Safety and Assurance Requirements Division, is responsible for the following: Establishing, developing, and directing the overall NASA safety program and priorities. (Requirement 8005)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	5.d(2)	8006	The Director, NASA Safety and Assurance Requirements Division, is responsible for the following: Serving as the senior safety official for the Agency and exercising functional management authority over all NASA safety and risk management activities. (Requirement 8006)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	5.d(4)	8008	The Director, NASA Safety and Assurance Requirements Division, is responsible for the following: Reviewing and evaluating NASA activities for conformance with prescribed safety policies, standards, and procedures and recommending or pursuing necessary corrective action to obtain conformance when discrepancies are identified. (Requirement 8008)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	5.d(5)	8009	The Director, NASA Safety and Assurance Requirements Division, is responsible for the following: The Director, Safety and Assurance Requirements Division, is empowered, on behalf of the Associate Administrator for Safety and Mission Assurance, to terminate any operation that presents an immediate and unacceptable risk to personnel, property, or mission operations. When this occurs, immediate notification will be made to the affected Center and Institutional Program Office officials.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	5.d(7)	8011	The Director, NASA Safety and Assurance Requirements Division, is responsible for the following: Preparation and distribution of NASA Safety Program information.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	5.e(5)	8017	The CHMO is responsible for the following: The CHMO shall terminate any NASA operation considered an immediate health hazard. When this occurs, immediate notification will be made to the affected Center and Institutional Program Officer.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	5.f(1)	8021	Director, Headquarters Operations, and Center Directors are responsible for the following: Designating a senior manager as the Center safety and health official. (Requirement 8021)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	5.f(2)	8022	Director, Headquarters Operations, and Center Directors are responsible for the following: Developing, implementing, and maintaining an effective safety and health program consistent with NASA, State, and Federal requirements. (Requirement 8022)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8710.2D	5.f(3)	8023	Director, Headquarters Operations, and Center Directors are responsible for the following: Utilizing the NASA Lessons Learned Information System for documenting, investigating, and applying safety lessons learned, as applicable, for all programs and projects. (Requirement 8023)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPD 8720.1B	5.e.(1)	13042	The Center SMA functional manager is responsible for: Ensuring that Reliability and Maintainability data is available for use as heritage data both to support current programs/projects at other Centers and to establish Reliability and Maintainability goals and requirements for follow-on or new programs/projects. (Requirement 13042)	S	I	I	RMS	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.01.1	22003	The NASA Administrator is the senior person responsible for Agency wide safety and health. (Requirement 22003)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.01.2(1)	22004	OSHA requires that each agency head designate an official with sufficient authority and responsibility to represent effectively the interest and support the agency head in the management and administration of the agency occupational safety and health program. (Requirement 22004)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.01.2(2)	31542	The current Designated Agency Safety and Health Official (DASHO) for NASA is the Associate Administrator for the Office of Life and Microgravity Sciences and Applications. The DASHO holds responsibility for assuring that all OSHA regulatory requirements at the Agency level are fulfilled or implemented. (Requirement 31542)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.01.2(3)	31775	The DASHO holds responsibility for assuring that all OSHA regulatory requirements at the Agency level are fulfilled or implemented. The DASHO is responsible for assuring that safety and health officials are appointed at appropriate levels with adequate budgets and staffs to implement occupational safety and health programs at all operational levels as required by CFR 1960.6, paragraph (c). (Requirement 31775)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.02.1	22156	NASA Center Directors and the Assistant Administrator for Institutional and Corporate Management have the responsibility to ensure that the NASA occupational Health and safety programs are effectively implemented and operated at their Centers and Component Facilities. (Requirement 22156)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.1	2.02.2	22006	Other Officials-in-Charge of Headquarters Offices shall ensure that their organizations support the NASA Occupational Health and Safety Program. (Requirement 22006)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1	22007	Supervisors are responsible for ensuring a safe and healthful workplace. (Requirement 22007) This responsibility extends to any place where their employee(s) is engaged in work related to his/her job including international and extraterrestrial locations. Responsibilities include:	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1.1(1)	22090	Furnishing a safe and healthful place of employment and ensuring that identified hazards are eliminated or controlled through a rigorous proactive inspection and abatement process. (Requirement 22090)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1.2	22091	Ensuring that employees are informed of NASA safety and health programs and of the protection afforded employees through these programs. (Requirement 22091)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1.3	22092	Informing employees of the location of the nearest medical treatment facility, procedures for obtaining treatment, and methods for reporting occupational injuries or illnesses. (Requirement 22092)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1.4	22093	Instructioning employees to report hazardous conditions to their immediate supervisor or to their Center or Component Facility safety and health official. (Requirement 22093)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1.5	22094	Taking appropriate action to protect employees in imminent danger situations. (Requirement 22094)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1.6	22095	Informing employees of specific hazards associated with their workplace and duties and ensuring use of appropriate personal protective equipment. (Requirement 22095)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1.7(1)	22008	Ensuring that NASA employees are provided safety and health training as applicable to the work environment (see paragraph 2.5.2.6). (Requirement 22008)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1.7(2)	31544	Ensuring that employees are informed of their specific responsibilities and rights under the Act, Executive Order 12196, and 29 CFR Part 1960, and how they may participate in the safety and health program. (Requirement 31544)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1.8	22097	Cooperating with and assisting safety and health personnel while they are performing their duties as specified in the NASA Occupational Safety and Health (OSH) program. (Requirement 22097)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.03.1.9	22098	Ensuring timely reporting of mishaps and close calls and timely follow up of any corrective actions. (Requirement 22098)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.04.1	22100	Complying with safety and health standards, rules, and regulations, issued by NASA, Federal, State, and local authorities. (Requirement 22100)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.04.2	22101	Using established procedures to report suspected safety or health hazards. (Requirement 22101)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.04.3	22102	Promptly obtaining necessary emergency medical care as the result of an occupational injury or illness. (Requirement 22102)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.04.4	22103	Promptly reporting occupational injuries, illnesses, mishaps, and close calls in accordance with established procedures. (Requirement 22103)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.04.5	22104	Cooperating with safety and health personnel during inspections, surveys, and investigations. (Requirement 22104)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.04.6	22105	Utilizing protective equipment when prescribed and/or required by safety or health standards, good work practices, or when directed by supervisors. (Requirement 22105)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.05.1.1	22107	Access to documents describing NASA's occupational safety and health programs including the Act, applicable Executive orders, Federal, State, and local regulations, and standards. (Requirement 22107)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.05.1.2.	22108	Access to the log and summary of occupational injuries and illnesses, including OSHA Form 100F or its equivalent, subject to the Privacy Act of 1974, as amended, 5 U.S.C. 552a. (Requirement 22108)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.05.1.3.	22109	Access to proposed NASA occupational safety and health standards and encouraged to provide comments to their appropriate representatives or committees. (Requirement 22109)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.05.1.4.	22110	Access to inspection reports, job hazard analyses of the work site, associated job safety and health documentation, and accident investigations. (Requirement 22110)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.05.2.1.	22111	NASA-sponsored medical examinations at no cost when the Center or Component Facility occupational health or safety representative identifies significant exposure or significant potential for exposure to a chemical, physical, or biological agent in the work environment. (Requirement 22111)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.05.2.2.	22112	Safety and health training, appropriate for the degree of hazard associated with their occupation or workplace. (Requirement 22112)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.05.3	22011	Employees shall be represented on Center or Component Facility safety and health committees or their subcommittees. (Requirement 22011)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.05.6	22013	Employees shall be authorized official time to participate in the Agency safety and health programs and in the activities provided for in Section 19 of the Act, Executive Order 12196, and 29 CFR 1960. (Requirement 22013)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.06.1(1)	22014	Dissemination of Program Information: Employees must be made aware of the Center or Component Facility safety and health programs. (Requirement 22014)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.06.1(2)	31545	Dissemination of Program Information: Copies of Executive Order 12196, 29 CFR Part 1960, details of NASAs Occupational Safety and Health programs, and applicable safety and health standards shall be made available, upon request, to employees or employee representatives for review. (Requirement 31545)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.06.2	22015	A copy of the Center or Component Facility written safety and health program information shall be made available to each supervisor, safety and health committee member, and employee representatives. (Requirement 22015)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.06.3	22016	The Center or Component Facility safety and health official(s) shall assure that a poster (NASA Form 1613, "NASA Occupational Safety and Health Protection For Federal Employees") is conspicuously posted in each major facility informing employees of the provisions of the Act, Executive Order 12196, and NASAs Occupational Safety and Health programs. (Requirement 22016)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.06.3.1	31546	Individual NASA Centers or Component Facilities shall augment such posters with site specific information, which includes the following: Details of the Center or Component Facility procedure for responding to employee reports of potential unsafe or unhealthful conditions. (Requirement 31546)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.1	2.06.3.2	31547	Individual NASA Centers or Component Facilities shall augment such posters with site specific information, which includes the following: Details of NASAs procedure for filing allegations of discrimination or reprisal for participating in the safety or health program or for reporting potential unsafe or unhealthful conditions. (Requirement 31547)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.06.3.3	31548	Individual NASA Centers or Component Facilities shall augment such posters with site specific information, which includes the following: Locations where employees may obtain information regarding the Center or Component Facility safety and health programs. (Requirement 31548)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.06.3.4	31549	Individual NASA Centers or Component Facilities shall augment such posters with site specific information, which includes the following: Relevant information about the Centers safety and health committee. (Requirement 31549)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.06.4	22017	An annual summary of occupational injuries and illnesses shall be posted no later than 45 calendar days after the close of the fiscal year or otherwise disseminated in written form to all employees of the workplace. (Requirement 22017)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.07	22018	Freedom From Reprisal: No employee shall be subject to restraint, interference, coercion, discrimination, or reprisal for filing a report of an unsafe or unhealthful working condition, participation in the activities of the Agency's occupational safety and health programs, or the exercise of any right or privilege afforded by Section 19 of the Act, Executive Order 12196, or 29 CFR Part 1960. (Requirement 22018)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.09.5(1)	22120	Abatement of unsafe and unhealthful conditions is the primary responsibility of the Center Directors with assistance provided by the Center or Component Facility Safety and Health Office(s). (Requirement 22120)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.09.5(2)	31550	In the event the Center or Component Facility funding is inadequate to address and abate the hazard, it is the responsibility of the Associate Administrator to resolve any funding issue. (Requirement 31550)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.09.6(1)	22024	The safety and health inspections required by Subpart D, 29 CFR Part 1960, coupled with action in response to safety complaints and reports of deficiencies are intended to identify conditions requiring corrective action. Cost estimates are required for all projects. (Requirement 22024)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.09.6(2)	31551	The safety and health inspections required by Subpart D, 29 CFR Part 1960: In addition, the appropriate fund source type and a justification for action must be given. (Requirement 31551)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	2.10.2	22027	To ensure such compliance, Centers or Component Facilities shall: (.1) Provide Material Safety Data Sheets (MSDS) for hazardous materials which meet the content requirements of 29 CFR 1910.1200. (Requirement 22027) (.2) Meet requirements for system safety as outlined in NPR 8715.3, "NASA Safety Manual," for major hardware and software product development.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.1.1	22029	NASA will comply with safety and health standards promulgated under Section 6 of the Act, except where alternate/supplemental standards have been approved by the Secretary of Labor and NASA Headquarters. (Requirement 22123)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.2.2.1	31552	In developing and submitting alternate standards, NASA shall provide the following information: A statement of why NASA cannot comply with the OSHA standard or wants to adopt an alternate standard. (Requirement 31552)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.2.2.2	31553	In developing and submitting alternate standards, NASA shall provide the following information: The proposed alternate standard. (Requirement 31553)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.2.2.3	31554	In developing and submitting alternate standards, NASA shall provide the following information: An explanation of how the alternate standard provides equivalent or greater protection for the affected employees. (Requirement 31554)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.2.2.4	31555	In developing and submitting alternate standards, NASA shall provide the following information: A description of interim protective measures employed pending approval of the standard. (Requirement 31555)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.2.2.5	31556	In developing and submitting alternate standards, NASA shall provide the following information: A written summary of comments, if any, from interested employees, their representatives, or the applicable safety and health committee. (Requirement 31556)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.3.2.1	31557	In developing and submitting supplemental standards, NASA shall provide the following information: A statement of why NASA requires the development of the supplemental standard. (Requirement 31557)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.3.2.2	31558	In developing and submitting supplemental standards, NASA shall provide the following information: The proposed supplemental standard. (Requirement 31558)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.3.2.3	31559	In developing and submitting supplemental standards, NASA shall provide the following information: An explanation of how the supplemental standard provides protection for the affected employees. (Requirement 31559)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.3.2.4	31560	In developing and submitting supplemental standards, NASA shall provide the following information: A description of interim protective measures employed pending approval of the standard. (Requirement 31560)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.3.2.5	31561	In developing and submitting supplemental standards, NASA shall provide the following information: A written summary of comments, if any, from interested employees, their representatives, or the applicable safety and health committee. (Requirement 31561)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	3.6(1)	22035	When it is determined by the Center or program official approving the procurement request, in conjunction with the Center or Component Facility safety and/or health office(s), that NASA safety and/or health standards are required in statements of work, solicitations, and contracts, such standards will be identified and cited for all places where NASA employees work. (Requirement 22160)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.1.1(1)	22037	Frequency of Inspection: NASA Centers or Component Facilities will establish a formal schedule of inspections for all operations/facilities. All active areas and operations of each establishment shall be inspected at least annually. (Requirement 22037)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.1.1(2)	31562	Frequency of Inspection: More frequent inspections shall be conducted in all establishments where there is an increased risk of accident, injury, or illness due to the nature of the workplace. (Requirement 31562)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.1.2(1)	22038	Any facility, structure, operation, vehicle, or equipment that is in an inactive status must be inspected at least annually. (Requirement 22038)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.1.2(2)	31563	Prior to reactivation, the facility, structure, vehicle, operation, or equipment shall undergo a thorough inspection to identify potential hazards. (Requirement 31563)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.1	4.1.3	22039	Sufficient unannounced inspections and unannounced follow-up inspections shall be conducted to ensure the identification and abatement of hazardous conditions. (Requirement 22039)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.2.1	22041	Qualified inspectors shall conduct inspections. (Requirement 22041)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.2.2(1)	22042	Safety and health specialists must meet the qualifications as defined in 29 CFR 1960.2 and paragraph 1.2.9 of this NPR. (Requirement 22042)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.2.2(2)	31564	The Center or Component Facility safety and/or health official(s) shall be responsible for the determination and certification of qualified personnel including those stated in paragraph 1.2.9 of this NPR. (Requirement 31564)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.2.3	22043	Inspectors shall have sufficient documented training and experience in safety and health necessary for the recognition, evaluation, and general abatement suggestions/procedures of health and safety hazards. (Requirement 22043)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.3.2(1)	22045	The supervisor in charge of the establishment, or a person empowered to act for that official, shall undertake immediate abatement, or cease operations and withdraw exposed personnel who are not necessary for abating an imminent danger condition. (Requirement 22045)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.3.2(2)	31565	In the event the supervisor in charge of the establishment needs assistance to undertake full abatement, that official shall promptly contact the responsible Center officials, who shall assist in the abatement effort. (Requirement 31565)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.3.3	22046	Inspection personnel shall be provided the proper support equipment necessary to conduct a thorough inspection of the establishment involved. (Requirement 22046)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.4.1	22048	Employees are encouraged to report alleged unsafe or unhealthful conditions to the Center or Component Facility safety and/or health official(s). Upon request of the employee, his or her name shall not be disclosed except to the safety and/or health official(s) in connection with the report of a suspected unsafe or unhealthful condition. (Requirement 22048)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.4.2.a	31566	As a minimum the unhealthful conditions file shall contain the following: Date and time received. (Requirement 31566)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.4.2.b	31567	As a minimum the unhealthful conditions file shall contain the following: File number assigned. (Requirement 31567)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.4.2.c	31568	As a minimum the unhealthful conditions file shall contain the following: Location of condition. (Requirement 31568)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.4.2.d	31569	As a minimum the unhealthful conditions file shall contain the following: Description of condition reported. (Requirement 31569)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.4.2.e	31570	As a minimum the unhealthful conditions file shall contain the following: Hazard Classification. (Requirement 31570)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.4.2.f	31571	As a minimum the unhealthful conditions file shall contain the following: Action taken. (Requirement 31571)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.5.1(1)	22050	Notice of Unsafe or Unhealthful Conditions: Notice of Unsafe or Unhealthful Condition (NF 1390) or equivalent (any equivalent form must be approved by the DASHO or designee), hereinafter referred to as the notice (See Appendix A for sample), shall be issued not later than 15 days after completion of the inspection for safety violations or not later than 30 days for health violations. (Requirement 22050)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.5.1(2)	31572	Notice of Unsafe or Unhealthful Conditions: If the notice cannot be issued within the prescribed time period, reasons for the delay must be documented. The hazard will be posted if deemed necessary by the local safety and/or health official(s). (Requirement 31572)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.5.2	22051	The notice shall be sent to the supervisor in charge of the establishment for correction (and posting if directed by the safety or health office). (Requirement 22051) Local safety and health office(s) will establish closed-loop procedures to ensure necessary follow-up and correction.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.5.3	22052	The supervisor in charge of the establishment shall ensure that a copy of the notice is filed and retained for a period of 5 years after abatement and made available to OSHA or NIOSH officials upon request. (Requirement 22052) (Electronic versions are acceptable for recordkeeping purposes.)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.5.4(1)	22053	The notice shall indicate the risk assessment for the condition described. (Requirement 22053)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.5.4(2)	31573	A risk assessment process should be used to analyze and status overall risk potential. The risk assessment/analysis must be accomplished using two elements: Severity and Probability. (Requirement 31573).	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.1.1	31575	Abatement of Unsafe or Unhealthful Conditions: In response to reports of suspected unsafe or unhealthful conditions: For reported imminent danger conditions, immediate notification to their supervisor will be made and employees removed from exposure to the alleged imminent danger condition until an inspection has been made (within 24 hours as required by 29 CFR 1960). (Requirement 31575)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.1.2	31576	Abatement of Unsafe or Unhealthful Conditions: In response to reports of suspected unsafe or unhealthful conditions: Serious conditions - 3 working days. (Requirement 31576)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.1.3	31577	Abatement of Unsafe or Unhealthful Conditions: In response to reports of suspected unsafe or unhealthful conditions: Less than serious conditions (all others) - 20 working days. (Requirement 31577)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.2	22055	Where unsafe or unhealthful conditions are abated immediately upon discovery, the notice shall be noted to that affect and be filed and maintained in accordance with paragraph 4.5 of this NPR. (Requirement 22055)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.3	22056	Where conditions will be abated within 30 calendar days, the notice will so indicate. (Requirement 22056)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.4(1)	22057	Where conditions will require more than 30 calendar days to abate, the supervisor in charge of the establishment shall promptly prepare an abatement plan with the appropriate consultation of the establishment's safety and/or health official(s). (Requirement 22057)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.1	4.6.4(2)	31578	The NASA Safety and Health Hazard Abatement Form (NF 1584), or equivalent (any equivalent form must be approved by the DASHO or designee), may be used by NASA Centers or Component Facilities for this purpose. The plan shall contain an explanation of the circumstances of the delay in abatement, a proposed timetable for the abatement, and a summary of steps being taken in the interim to protect employees from being adversely exposed to the unsafe or unhealthful working condition. (Requirement 31578)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.4(3)	31579	The NASA Safety and Health Hazard Abatement Form (NF 1584): A copy of the plan shall be sent to the Center safety and health committee and to representatives of the employees. (Requirement 31579)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.4(4)	31580	The NASA Safety and Health Hazard Abatement Form (NF 1584): Any changes in an abatement plan will require the preparation of a new plan in accordance with the provisions of this paragraph. (Requirement 31580)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.5(1)	22058	When a hazard cannot be abated with the authority and resources of the supervisor in charge of the establishment, that official shall request assistance from the Center Director. (Requirement 22058)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.5(2)	31582	When a hazard cannot be abated: The local safety/health official, any established committee and/or employee representatives, and all personnel subject to the hazard shall be advised of this action and of interim protective measures in effect and shall be kept informed of subsequent progress on the abatement plan. (Requirement 31582)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.6.7	22060	For those deficiencies that can be rectified within 30 days, written notification by the supervisor in charge of the establishment indicating the corrective action and associated cost, along with verification of proper abatement by the safety and health office(s), is required. (Requirement 22060) (Use NASA Form 1390, "Notice of Unsafe or Unhealthful Conditions," or equivalent (any equivalent form must be approved by the DASHO or designee).)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.7(1)	22061	Access for OSHA and NIOSH representatives: Official representatives of OSHA and the National Institute of Occupational Safety and Health (NIOSH) are authorized to enter NASA establishments for purposes of inspection and/or evaluation of conditions therein. The NASA DASHO or designee must be notified immediately of any OSHA inspection or visit. (Requirement 22061)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.7(2)	31584	Access for OSHA and NIOSH representatives: Access to security controlled areas will be coordinated with the Center security officer. Such representatives shall be required to present appropriate identification, receive necessary security clearance, and be escorted during their visits. (Requirement 31584)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.7(3)	31585	OSHA and NIOSH representatives shall, upon request, be provided available safety and health information on the Center or Component Facility to be visited. (Requirement 31585)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	4.7(4)	31586	Upon request, they should also be provided photographic support, if available. Arrangements shall be made for such officials to interview and be accompanied by employees or representatives of employees during their visit. (Requirement 31586) Within 10 working days following written notification of findings of an inspection by OSHA or an evaluation by NIOSH, NASA Centers or Component Facilities will provide a summary of any findings and corrective action necessary to the DASHO.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	5.3(1)	22065	Center Executive Safety and Health Board or Equivalent: This committee will be established at each Center. The NASA Center Director or a designee will be the chairperson. Meetings will be scheduled at least semiannually and more often where conditions indicate a need. The purpose of this committee is to provide a forum for meaningful discussion of, and a channel for input to, managements decisions relative to occupational safety and health matters. For these reasons, membership should be broad based and will include representatives of both management and employees. Safety and health, as well as other technical personnel, should be either full members or advisors to the committee and should attend meetings. Agendas shall be prepared in advance and minutes kept and distributed to participants. (Requirement 22065)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	5.3(2)	31587	Each committee recommendation shall receive a formal response from management, within 30 days of receipt, as to the disposition of the recommendations and be incorporated in the minutes of subsequent meetings. (Requirement 31587)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	5.3(3)	31588	Copies of minutes shall be kept on file for review by Headquarters safety and health offices. (Requirement 31588)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	5.4(1)	22066	Subordinate Safety and Health Committees: Special safety and health committees may be formed on an ad hoc or continuing basis in accordance with 29 CFR 1960.38 to assist the NASA Center or Component Facility safety and health officials in dealing with particular programs, projects, geographical areas, or special operations. Committee members chosen for this assignment must receive safety or health training as required. (Requirement 22066)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	5.4(2)	31589	Subordinate Safety and Health Committees: NASA Centers or Component Facilities are also encouraged to form supervisor- and employee level safety committees to assist in the implementation of the safety and health programs. Written minutes of each committee meeting shall be maintained and distributed per 29 CFR 1960.37. (Requirement 31589)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.2	22067	Center Director Responsibility: The Center Director has the ultimate responsibility to assure that adequate training is provided to personnel in accordance with Federal and NASA requirements. (Requirement 22067) In performance of this responsibility, the Center Director shall:	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.2.1	22142	Identify safety and health training needs. (Requirement 22142)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.2.2	22143	Budget for safety and health training requirements. (Requirement 22144)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.2.3	22144	Develop safety and health training courses. (Requirement 22144)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.2.4	22145	Maintain training records to reflect employee safety and health training. (Requirement 22145)	S	I	I	Safety	CxP 70059	2.5	SAF-1045



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NPR 8715.1	6.3	22068	DASHO Responsibility: The DASHO shall assure that safety and health officials are designated at each appropriate level with sufficient authority and responsibility to plan for and assure funds for safety and health staff, equipment, materials, and training required to ensure implementation of an effective occupational safety and health program. (Requirement 22068)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.4.1	31590	Agency Safety and Health Managers: Establishing safety and health training policies and accessing Center or Component Facility performance with OSHA and NASA requirements. (Requirement 31590)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.4.2	31591	Agency Safety and Health Managers: Advocating additional training budget needs with the DASHO and OSHEB, based on Center or Component Facility performance evaluations, and/or budget communications. (Requirement 31591)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.4.3	31592	Agency Safety and Health Managers: Sponsoring training course development and maintaining a catalog of available training courses to augment Center or Component Facility training programs. (Requirement 31592)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.4.4	31593	Agency Safety and Health Managers: Maintaining liaisons with other government and industry training organizations for the purposes of cross fertilization and lessons learned. (Requirement 31593)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.5.1	31594	Personnel to be Trained: Appropriate instruction and job-related safety and health training are required for the following employees: Top management officials including program/project managers. (Requirement 31594)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.5.2	31595	Personnel to be Trained: Appropriate instruction and job-related safety and health training are required for the following employees: Supervisors. (Requirement 31595)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.5.3	31596	Personnel to be Trained: Appropriate instruction and job-related safety and health training are required for the following employees: Safety and health professionals. (Requirement 31596)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.5.4	31597	Personnel to be Trained: Appropriate instruction and job-related safety and health training are required for the following employees: Collateral duty safety and health personnel and safety and health committee members. (Requirement 31597)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.5.5	31598	Personnel to be Trained: Appropriate instruction and job-related safety and health training are required for the following employees: Employees and employee representatives. (Requirement 31598)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.1	31599	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: Essential features of the Occupational Safety and Health Act. (Requirement 31599)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.2	31600	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: Content of Executive Order No. 12196. (Requirement 31600)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.3	31601	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: The requirements of 29 CFR Part 1960, "Basic Program Elements for Federal Employee Occupational Safety and Health Programs," and related matters. (Requirement 31601)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.4	31602	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: NASAs occupational safety and health policies and program requirements. (Requirement 31602)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.5.1	31604	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: Specific job-related information such as: Hazards of the job task. (Requirement 31604)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.5.2	31605	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: Specific job-related information such as: Safe and healthful work practices. (Requirement 31605)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.5.3	31606	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: Specific job-related information such as: Hazards of the work environment. (Requirement 31606)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.5.4	31607	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: Specific job-related information such as: Necessity for and proper use and care of personal protective equipment. (Requirement 31607)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.5.5	31608	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: Specific job-related information such as: Pertinent emergency procedures. (Requirement 31608)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.5.6	31609	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: Specific job-related information such as: Methods for reporting of mishaps, occupational injuries, illnesses, and hazardous conditions. (Requirement 31609)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	6.6.5.7	31610	Training Course Content: The training program should be structured so as to ensure that the following information be provided to civil servants, as required, for their specific jobs as reflected in paragraph 6.3: Specific job-related information such as: Safety and health standards applicable to the work environment. (Requirement 31610)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	7.2.1	22072	Annual Summary - Occupational Injuries/Illnesses (OSHA Form 102F and 102FF) summarizing the calendar year information will be forwarded to the DASHO or their designee within 30 days following the end of the calendar year. (Requirement 22072) A summary of all open abatement plans and a listing of those closed during the reporting period will also be provided to the DASHO or designee as part of the input to the annual report.	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.1	8.1.1	22075	Institutional/Facility/Operational Safety Audits and Biennial Occupational Health Audits of NASA Center or Component Facility safety and health programs by responsible Headquarters offices will be conducted on a frequency stipulated in their respective policy documents. These audits should provide some basis for input into the NASA self-evaluation review process (see paragraph 8.2 of this NPR). (Requirement 22075)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	8.1.2.1	31611	Surveys will include qualitative assessments of the extent to which the Center or Component Facility safety and health programs are: Compliant with NASA policy and procedures. (Requirement 31611)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	8.1.2.2	31612	Surveys will include qualitative assessments of the extent to which the Center or Component Facility safety and health programs are: Compliant with Executive Order 12196 and provisions of 29 CFR Part 1960. (Requirement 31612)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	8.1.2.3	31613	Surveys will include qualitative assessments of the extent to which the Center or Component Facility safety and health programs are: Implemented effectively by the Center or Component Facility. (Requirement 31613)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	8.1.2.4	31614	Surveys will include qualitative assessments of the extent to which the Center or Component Facility safety and health programs are: Consistent with recognized good practice. (Requirement 31614)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	8.2(1)	22077	Center Self-Evaluations: Centers or Component Facilities will perform self surveys of their safety and health programs and submit the reports in conjunction with the annual OSHA report (see paragraph 7.2.1 of this NPR). (Requirement 22077)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.1	8.2(2)	31615	Center Self-Evaluations: Centers or Component Facilities shall use the OSHA baseline questionnaire, which is based on 29 CFR 1960 requirements, to perform the self evaluations. (Requirement 31615)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	1.0(2)	31616	NASA will establish emergency response plans and be prepared to: Protect lives. (Requirement 31616)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	1.0(3)	31617	NASA will establish emergency response plans and be prepared to: Protect the environment. (Requirement 31617)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	1.0(4)	31618	NASA will establish emergency response plans and be prepared to: Minimize the loss of, or damage to, NASA resources. (Requirement 31618)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	1.0(5)	31619	NASA will establish emergency response plans and be prepared to: Provide for the continuous operation or timely resumption of critical services and missions. (Requirement 31619)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	1.0(6)	31620	NASA will establish emergency response plans and be prepared to: Aid in the recovery and timely resumption of normal operations. (Requirement 31620)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	1.0(7)	31621	NASA will establish emergency response plans and be prepared to: Assist in mitigating hazards and minimizing the effects of a natural or technological emergency or disaster. (Requirement 31621)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	1.0(8)	31622	NASA will establish emergency response plans and be prepared to: Support local, State, and Federal agencies and appropriate emergency response authorities. (Requirement 31622)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	2.1.1	23073	NASA activities take place at different locations, and consequently, potential emergencies may be varied. Site plans for NASA Centers and details on the types of emergencies that each Center within NASA could expect to face are contained in the individual Center Emergency Preparedness Plans. Copies of these plans are on file with the Safety and Assurance Requirements Division and are available for review upon request. (Requirement 23073)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	2.1.2.1	23002	This NPR constitutes the Agency Emergency Preparedness Program Plan and uses the DHS/FEMA format to address unique NASA emergency preparedness concerns. This NPR should be reviewed at least annually and updated as required. (Requirement 23002)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	2.1.2.2(1)	23003	NASA Centers (including Component Facilities) shall develop multihazard functional emergency preparedness program plans using the FEMA format. (Requirement 23003)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	2.1.2.2(2)	31623	Centers will review plans annually and update them as required. (Requirement 31623)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	2.1.2.2(3)	31624	Centers will forward a copy of the emergency preparedness plans, including site maps, to the Office of Security and Program Protection. (Requirement 31624)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.1	23006	Office of Security and Program Protection: The Office of Security and Program Protection, NASA Headquarters, will respond to national emergencies and major natural or technological disasters, as requested by NRP. (Requirement 23006)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2	23007	NASA Centers: Each NASA Center shall be prepared to respond to local emergencies and major natural or technological disasters within their confines or at other NASA Centers and to support the appropriate tasking per the NRP. (Requirement 23007)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2.1.1(1)	23008	The NASA Emergency Preparedness Program Planning Group is responsible for recommending modifications to the NASA emergency preparedness plan. (Requirement 23008)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2.1.1(2)	31625	The NASA Emergency Preparedness Program Planning Group: This group, chaired by the Office of Safety and Mission Assurance, consists of NASA Emergency Preparedness Coordinators and representatives from Headquarters Codes and Centers. Each NASA Center is responsible for its own emergency plan(s). (Requirement 31625)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2.1.2	23009	The Office of Security and Program Protection will coordinate planning and support between NASA Centers. (Requirement 23009)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2.2.1	31626	The minimum requirements for exercising emergency plans are as follows: Annual tabletop exercise at the Center level. (Requirement 31626)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2.2.2	31627	The minimum requirements for exercising emergency plans are as follows: Annual functional exercise (single scenario) at the Center level. (Requirement 31627)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2.2.3	31628	The minimum requirements for exercising emergency plans are as follows: Biennial functional Agencywide exercises (in conjunction with a Center exercise or a Federal emergency exercise as required by the NRP). (Requirement 31628) In the event of an actual emergency, the response may be counted as a fulfillment of the required annual functional exercise.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2.3.1(1)	23010	The Assistant Administrator for Security and Program Protection is responsible for the overall management of the NASA Emergency Preparedness Program. (Requirement 23010)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.2	3.2.3.1(2)	31629	The Assistant Administrator for Security and Program Protection is responsible for: Each NASA Center Director shall ensure development of that portion of the plan applicable to the mission and needs of the Center and its Component Facilities. (Requirement 31629)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2.3.2	23011	When notified of a NASA Center emergency, the Office of Security and Program Protection will activate and operate the NASA Emergency Operations Center (EOC) from the Office of Security and Program Protection, Washington, DC, 20546. (Requirement 23011)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2.3.3	23012	When support is requested by DHS/FEMA under the NRP, the Assistant Administrator for Security and Program Protection, or designee, who serves as NASA's representative to the CDRG, will report to the DHS/FEMA Emergency Information and Coordination Center (EICC). The representative shall be the focal point for coordination with the appropriate NASA management to facilitate decisions, problem resolution, and policy issue clarification as required. (Requirement 23012)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.2.3.4	23013	Requests for NASA resources beyond the capability of the local NASA Center shall be directed through the NASA EOC for action by the appropriate NASA Mission Directorate Associate Administrators/Headquarters Center Executives (AA/HCEs). (Requirement 23013)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	3.3	23016	State of Emergency Declaration: After a major natural or technological disaster, the affected Center Director, or designee, shall declare a state of emergency, coordinate with local, State, and Federal agencies, and notify NASA Headquarters, Office of Security and Program Protection during other than normal work hours. (Requirement 23016) The Office of Security and Program Protection will notify the NASA Administrator and appropriate Mission Support and Mission Directorate offices and activate the Headquarters EOC to request and coordinate, as appropriate, assistance from other NASA organizations and Federal agencies.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.2	23018	Planning: Each NASA Center shall establish preparedness activities, programs, plans, and systems to ensure readiness and to enhance response to an emergency or disaster. (Requirement 23018) To achieve this goal, each NASA Facility shall develop an emergency plan and procedures that include, but are not limited to, the following:	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.2.a	31630	Planning: Each NASA Center shall establish preparedness activities for the following: Designation of a Center Emergency Preparedness Coordinator. (Requirement 31630)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.2.b(1)	31631	Planning: Each NASA Center shall establish preparedness activities for the following: Hazard/threat identification and analysis (see Table 4-1). (Requirement 31631)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.2.b(2)	31632	Planning: Each NASA Center shall establish preparedness activities for the following: NASA Centers will conduct a thorough vulnerability analysis to identify potential hazards/threats. (Requirement 31632)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.2.b(3)	31633	Planning: Each NASA Center shall establish preparedness activities for the following: Center emergency preparedness programs will include a mitigation component to reduce or eliminate identified risks based on their vulnerability analysis. (Requirement 31633)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.3	23019	Response: Certain emergency response procedures require unique and specialized plans and actions that can be anticipated and preplanned to support the overall response effort. In this regard, each NASA Center Emergency Preparedness Program Plan shall contain procedures and checklists to support specific emergency response activities. (Requirement 23019) These should include, but not be limited to, the following:	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.3.a	31634	Response: Certain emergency response procedures require unique and specialized plans and actions that can be anticipated and preplanned to support the overall response effort. In this regard, each NASA Center Emergency Preparedness Program Plan shall contain procedures and checklists to support specific emergency response activities. These should include, but not be limited to, the following: Activation of Center emergency response teams. (Requirement 31634)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.3.b	31635	Response: Certain emergency response procedures require unique and specialized plans and actions that can be anticipated and preplanned to support the overall response effort. In this regard, each NASA Center Emergency Preparedness Program Plan shall contain procedures and checklists to support specific emergency response activities. These should include, but not be limited to, the following: Activation of the Center Emergency Operations Center (EOC) and alternate EOC, if required. (Requirement 31635)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.3.c	31636	Response: Certain emergency response procedures require unique and specialized plans and actions that can be anticipated and preplanned to support the overall response effort. In this regard, each NASA Center Emergency Preparedness Program Plan shall contain procedures and checklists to support specific emergency response activities. These should include, but not be limited to, the following: Exercises and drills. (Requirement 31636)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.3.d	31637	Response: Certain emergency response procedures require unique and specialized plans and actions that can be anticipated and preplanned to support the overall response effort. In this regard, each NASA Center Emergency Preparedness Program Plan shall contain procedures and checklists to support specific emergency response activities. These should include, but not be limited to, the following: Use of Incident Command System (ICS) including telecommunications support resources. (Requirement 31637)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.3.e	31638	Response: Certain emergency response procedures require unique and specialized plans and actions that can be anticipated and preplanned to support the overall response effort. In this regard, each NASA Center Emergency Preparedness Program Plan shall contain procedures and checklists to support specific emergency response activities. These should include, but not be limited to, the following: Coordination with local, State, and Federal agencies. (Requirement 31638)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.2	4.3.f	31639	Response: Certain emergency response procedures require unique and specialized plans and actions that can be anticipated and preplanned to support the overall response effort. In this regard, each NASA Center Emergency Preparedness Program Plan shall contain procedures and checklists to support specific emergency response activities. These should include, but not be limited to, the following: Recall and notification of essential personnel. (Requirement 31639)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	4.3.g	31640	Response: Certain emergency response procedures require unique and specialized plans and actions that can be anticipated and preplanned to support the overall response effort. In this regard, each NASA Center Emergency Preparedness Program Plan shall contain procedures and checklists to support specific emergency response activities. These should include, but not be limited to, the following: Damage assessment. (Requirement 31640)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	5	23021	Continuity of Agency Operations: All NASA Center Emergency Preparedness Program Plans shall identify the management succession structure to support the necessary decision making and emergency response activities associated with the Emergency Preparedness Program. (Requirement 23021) Refer to NASA Policy Directive 1000.3, "The NASA Organization," for the Agency management succession during emergencies.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.01.1	23078	Support Executive Orders 12148 and 12656 and coordinate with the Department of Defense (DoD) to prepare for the use, maintenance, and development of technologically advanced aerospace and aeronautical-related systems, equipment, and methodologies applicable to national security emergencies. (Requirement 23078)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.01.2	23023	Appoint a senior policy official responsible for maintaining an Agency Emergency Preparedness Program that includes objectives, plans, and budgetary requirements. (Requirement 23023)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.01.3	23080	Provide management with the means and the staffing to make the Emergency Preparedness Program Plan operative (i.e., place priority and responsibilities on Headquarters Offices, NASA Centers, and operating locations) to ensure ability to respond to local, national, and international emergencies. (Requirement 23080)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.01.4	23081	Support the Federal Response Plan and maintain a worldwide contingency system through established national and international agreements. (Requirement 23081)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.01.5	23082	Ensure that data/archives records preservation plans are managed in accordance with NPR 1441.1, "NASA Records Retention Schedules," (e.g., collect and store all important records, such as personnel, pay, mission program data, facility engineering design plans/drawings) and provide for assistance to NASA Centers in post disaster recovery of vital records. This activity will be managed by the Chief Information Officer. (Requirement 23082)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.02	23024	The Office of the Chief Financial Officer/Comptroller shall perform the following: (Requirement 23024)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.02.a	31641	The Office of the Chief Financial Officer/Comptroller shall perform the following: Provide funding as approved in support of a viable Emergency Preparedness Program. (Requirement 31641)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.02.b	31642	The Office of the Chief Financial Officer/Comptroller shall perform the following: Assist and advise on Emergency Preparedness Program budget development. (Requirement 31642)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.02.c	31643	The Office of the Chief Financial Officer/Comptroller shall perform the following: Provide interagency funding for supporting exercises and requirements under the Robert T. Stafford Disaster Relief and Emergency Assistance Act. (Requirement 31643)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.02.d	31644	The Office of the Chief Financial Officer/Comptroller shall perform the following: Provide systems that will account for emergency preparedness expenditures. (Requirement 31644)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.05.a	31645	The Office of Human Capital Management shall perform the following: Establish response procedures for Center Directors to determine personnel leave or personnel pay policies in the event of Center loss or closure. (Requirement 31645)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.05.b	31646	The Office of Human Capital Management shall perform the following: Provide the training and education budget for NASA emergency preparedness personnel. (Requirement 31646)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.06.a	31647	The Office of the General Counsel shall perform the following: Provide legal advice on compliance with Federal, State, and local laws as applicable to emergency preparedness. (Requirement 31647)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.06.b	31648	The Office of the General Counsel shall perform the following: Provide legal advice on NASA interagency agreements, Memoranda of Agreement (MOAs), and Memoranda of Understanding (MOUs), with Federal, State, or local agencies. (Requirement 31648)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.06.c	31649	The Office of the General Counsel shall perform the following: Provide legal liaison with other Federal agencies assigned NRP responsibilities. (Requirement 31649)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.06.d	31650	The Office of the General Counsel shall perform the following: Provide legal review of emergency preparedness program plans and documents, including the NSEP Plan. (Requirement 31650)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.07	23029	The Office of Procurement shall authorize and make available all lawful and otherwise permissible procurement techniques appropriate to the emergency. (Requirement 23029) For example, waiver to the requirements for synopsis, competition, solicitation review, etc., may be used when warranted.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.a	31651	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Support the Assistant Administrator for Security and Program Protection, who is designated as the responsible official for national security emergency preparedness program planning and coordination in support of E.O. 12656 and for writing NASAs NSEP Plan (Appendix E). (Requirement 31651)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.b	31652	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Provide resource management advice and guidance. (Requirement 31652)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.c	31653	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Coordinate emergency relocation of affected Centers, as required. (Requirement 31653)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.2	6.1.08.d	31654	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Review surveys and perform staff-assistance visits. (Requirement 31654)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.e	31655	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Assist the Office of Security and Program Protection in the identification of Office of Infrastructure, Management, and Headquarters Operations emergency response and recovery capabilities. (Requirement 31655)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.f	31656	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Provide Agency management of physical security assets. (Requirement 31656)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.g	31657	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Participate, when called upon to support the CDRG, in emergency conditions and exercises. (Requirement 31657)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.h	31658	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Coordinate postevent Facility recovery and assessment. (Requirement 31658)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.i	31659	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Manage the Continuity of Government (COG) effort for National security (See Appendix E). (Requirement 31659)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.j(1)	31660	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Support the NASA Emergency Preparedness Program with respect to environmental regulatory compliance issues. (Requirement 31660)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.j(2)	31661	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Advise and keep NASA Headquarters and Centers aware of current and pending environmental regulations regarding emergency preparedness. (Requirement 31661)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.k	31662	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Maintain the viability of the critical infrastructure in the event of an emergency, as prescribed by Presidential Decision Directive (PDD) 63 using the NASA Critical Infrastructure Protection Plan. (Requirement 31662)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.L	31663	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Coordinate the planning and implementation of the Critical Infrastructure Protection Plan with the Office of Security and Program Protection and all NASA Center Emergency Preparedness Coordinators. (Requirement 31663)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.m	31664	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Support the plan, maintaining the viability of the infrastructure in the event of an emergency, as part of the role of the Chief Infrastructure Assurance Officer. (Requirement 31664)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.o	31665	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Support the NASA Emergency Preparedness Program and the NRP by responding to specific tasks as assigned, including requests from DHS/FEMA. (Requirement 31665)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.p	31666	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Interface with the General Services Administration and identify the minimum emergency preparedness requirements for Headquarters Offices. (Requirement 31666)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.q	31667	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Author the Headquarters Center Emergency Preparedness Program Plan. (Requirement 31667)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.r	31668	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Design and implement the plan for notification and alert of NASA officials during other than normal work hours (See Appendix C). (Requirement 31668)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.s	31669	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Design and implement the Headquarters Contingency Replication Plan to provide for the relocation of selected portions of NASA Headquarters in the event that Headquarters facilities are no longer useable (See Appendix D). (Requirement 31669)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.08.t	31670	The Office of Infrastructure, Management, and Headquarters Operations shall perform the following: Exercise the NASA Headquarters relocation activity portion of the NASA Security Emergency Preparedness (NSEP) Plan. (Requirement 31670)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.09	23031	The Office of Small and Disadvantaged Business Utilization shall provide assistance in the award of emergency procurement contracts through the use of small and disadvantaged business entities. (Requirement 23031)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.10.a	31674	The Office of Legislative Affairs shall perform the following: Support the NASA Emergency Preparedness Program at the appropriate legislative level. (Requirement 31674)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.10.b	31675	The Office of Legislative Affairs shall perform the following: Advise and keep NASA Headquarters and Centers aware of current and pending legislation regarding emergency preparedness. (Requirement 31675)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.a	31676	The Space Operations Mission Directorate shall perform the following: Support each NASA Center in emergency preparedness when called upon for special resource capabilities. (Requirement 31676)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.b	31677	The Space Operations Mission Directorate shall perform the following: Update annually and report status of the resources available to support the NASA Emergency Preparedness Program. This is to specifically address NASAs mission-critical operational flight programs and communications. (Requirement 31677)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.c	31678	The Space Operations Mission Directorate shall perform the following: In coordination with the NASA Administrator, respond to appropriate Executive Branch Secretary requests levied on NASA programs for NSEP technical or flight program support resources when national security situations develop beyond the scope of the NASA Emergency Preparedness Program Plan. In such cases, the Space Operations Mission Directorate-managed resources may be handled outside the provisions of the Plan. (Requirement 31678)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.2	6.1.11.d	31679	The Space Operations Mission Directorate shall perform the following: Fund the Emergency Preparedness Program at Johnson Space Center, Kennedy Space Center, Marshall Space Flight Center, and Stennis Space Center, including Component Facilities. (Requirement 31679)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.e	31680	The Space Operations Mission Directorate shall perform the following: Appoint an emergency preparedness representative to serve as a liaison to the Office of Security and Program Protection EOC as dictated by the magnitude of the emergency. (Requirement 31680)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.f	31681	The Space Operations Mission Directorate shall perform the following: Respond to requests from DHS/FEMA, with Office of Security and Program Protection coordination. (Requirement 31681)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.g	31682	The Space Operations Mission Directorate shall perform the following: Support reconnaissance and damage assessment and reporting to the Office of Security and Program Protection. (Requirement 31682)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.h	31683	The Space Operations Mission Directorate shall perform the following: Identify NSEP assets and response capabilities for the Office of Security and Program Protection. (Requirement 31683)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.i	31684	The Space Operations Mission Directorate shall perform the following: Appoint a senior NASA official to coordinate telecommunications policy with the Office of the Manager, National Communications System, in accordance with E.O. 12472 and the NASA MOU. (Requirement 31684)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.j	31685	The Space Operations Mission Directorate shall perform the following: Support Federal and Agency NSEP telecommunications mobilization under national emergency conditions declared by the President or other competent Federal authority, e.g., pursuant to E.O. 12656 and National Security Decision Directives 47 and 97. (Requirement 31685)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.k	31686	The Space Operations Mission Directorate shall perform the following: Ensure that NASAs terrestrial and space-borne spectrum-dependent telecommunications systems are properly licensed under national and international radio frequency rules and regulations. (Requirement 31686)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.L	31687	The Space Operations Mission Directorate shall perform the following: Authorize controlled-access interfaces to automated information systems, i.e., those telecommunications and computing networks or systems under the Space Operations Mission Directorate's cognizance, during national or regional emergencies. (Requirement 31687)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.m	31688	The Space Operations Mission Directorate shall perform the following: Provide technical assistance and consultation to the Office of Security and Program Protection and others on contingency or emergency administrative telecommunications requirements that may be required and approved to support the NASA Emergency Preparedness Program. (Requirement 31688)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.n	31689	The Space Operations Mission Directorate shall perform the following: Fund national or NASAs NSEP telecommunications services or initiatives. According to E.O. 12472, Office of Management and Budget (OMB) guidance, this is to include special procurements or other arrangements between the Space Operations Mission Directorate, the Office of Security and Program Protection, and other appropriate NASA Headquarters Offices having institutional responsibilities. (Requirement 31689)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.o	31690	The Space Operations Mission Directorate shall perform the following: Identify, for the Office of Security and Program Protection, all NSEP telecommunications assets funded and managed by the Space Operations Mission Directorate. As appropriate and available, participate in NASA and national-level (sponsored by the DoD/National Communications System/FEMA) exercises to respond to an actual emergency or disaster. (Requirement 31690)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.p	31691	The Space Operations Mission Directorate shall perform the following: Provide, where appropriate and compatible, controlled-access interface with Space Operations Mission Directorate-managed telecommunications, tracking, and computing resources during national, international, and/or regional NSEP emergencies declared by the President. (Requirement 31691)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.q	31692	The Space Operations Mission Directorate shall perform the following: Support NASAs mission-critical flight (including aeronautics) programs and NASA's emergency essential functions in accordance with the Space Operations Mission Directorate charter and agreements and/or MOUs with other Federal agencies. (Requirement 31692)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.r	31693	The Space Operations Mission Directorate shall perform the following: Provide support to each continental United States-based space flight tracking installation. (Requirement 31693)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.s	31694	The Space Operations Mission Directorate shall perform the following: Provide support to foreign space flight tracking installations pursuant to provisions of MOAs with host countries. (Requirement 31694)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.11.t	31695	The Space Operations Mission Directorate shall perform the following: Support Emergency Preparedness Program funding for nationally and internationally located facilities or sites. (Requirement 31695)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.12.a	31696	The Office of Public Affairs shall perform the following: Function as the single Agency spokesperson to all external resources/personnel. (Requirement 31696)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.12.b.1)	31698	The Office of Public Affairs shall perform the following: Act as liaison with the media to accomplish the following: Provide pre-event coordination, if possible., (Requirement 31698)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.12.b.2)	31699	The Office of Public Affairs shall perform the following: Act as liaison with the media to accomplish the following: Establish and operate an emergency news center, (Requirement 31699)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.12.b.3)	31700	The Office of Public Affairs shall perform the following: Act as liaison with the media to accomplish the following: Provide timely and accurate information to the news media. (Requirement 31700)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.12.b.4)	31701	The Office of Public Affairs shall perform the following: Act as liaison with the media to accomplish the following: Provide escort as required; coordinate press releases with Headquarters and Centers., (Requirement 31701)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.2	6.1.12.b.5)	31702	The Office of Public Affairs shall perform the following: Act as liaison with the media to accomplish the following: Coordinate procedures for contact to national media agencies. (Requirement 31702)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.12.b.6)	31703	The Office of Public Affairs shall perform the following: Prepare postevent articles and press releases.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.12.c	31704	The Office of Public Affairs shall perform the following: Provide coordination for the utilization of the Emergency Broadcast System. (Requirement 31704)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.12.d	31705	The Office of Public Affairs shall perform the following: Provide public affairs support for emergency preparedness awareness. (Requirement 31705)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.12.e	31706	The Office of Public Affairs shall perform the following: Provide public affairs support to the CDRG. (Requirement 31706)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.12.f	31707	The Office of Public Affairs shall perform the following: Appoint a public affairs representative to serve as a liaison to the Office of Security and Program Protection EOC as dictated by the magnitude of emergency. (Requirement 31707)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.a	23037	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Define emergency preparedness management structure, i.e., Center to Headquarters (flow chart). (Requirement 23037)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.b	31708	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Identify minimal Center emergency response capability. (Requirement 31708)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.c	31709	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Coordinate support with Federal agencies. (Requirement 31709)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.d	31710	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Provide support to CDRG. (Requirement 31710)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.e	31711	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Endorse the use of the Incident Command System (ICS) for emergency responses throughout NASA. (Requirement 31711)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.f	31712	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Activate the EOC as needed. Generally, the EOC is activated any time two or more emergency response elements are employed. (Requirement 31712)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.g	31713	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Monitor NASA Center agreements and plans as related to emergency preparedness. (Requirement 31713)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.h	31714	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Develop an Agency top-level Emergency Preparedness Program, that complies with Federal requirements, for NASA Center use. (Requirement 31714)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.i	31715	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Provide emergency preparedness and response advice to the NASA Administrator. (Requirement 31715)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.j	31716	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Provide guidance to all NASA offices for operation of the Emergency Preparedness Program. (Requirement 31716)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.k	31717	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Provide guidance for tasks received by NASA offices and Centers from DHS/FEMA and other Federal agencies. (Requirement 31717)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.L	31718	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Provide advocacy for budget items. (Requirement 31718)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.m	31719	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Determine the need for, and if necessary advocate, the acquisition of specialized computer software to develop Emergency Preparedness Program Plans, annexes, and exercises. (Requirement 31719)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.n	31720	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Conduct reviews of each Center and its Emergency Preparedness Program Plan at least biennially. (Requirement 31720)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.o	31721	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Conduct an emergency preparedness coordinators meeting at least annually (rotated among all NASA Centers). (Requirement 31721)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.p	31722	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Provide or recommend training for assigned emergency preparedness coordinators. (Requirement 31722)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.q	31723	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Review after-action Agency investigative reports and lessons learned. (Requirement 31723)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.r	31724	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Review damage assessment and prioritization of recovery actions. (Requirement 31724)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.13.2.s	31725	Assistant Administrator for Security and Program Protection: The NASA Emergency Preparedness Coordinator shall perform the following: Serve as the NASA point of contact to DHS/FEMA at the Headquarters level for the National Response Plan and all related FEMA matters. (Requirement 31725)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.14.a	31726	Aeronautics research Mission Directorate shall perform the following: Respond to requests from the Office of Security and Program Protection in support of the NASA Emergency Preparedness Program. (Requirement 31726)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.2	6.1.14.b	31727	Aeronautics research Mission Directorate shall perform the following: Provide support to each NASA Center in performing emergency preparedness. (Requirement 31727)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.14.c	31728	Aeronautics research Mission Directorate shall perform the following: Provide the Office of Security and Program Protection an annual status report on the resources available to support the NASA Emergency Preparedness Program. (Requirement 31728)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.14.d	31729	Aeronautics research Mission Directorate shall perform the following: Provide resources for the Emergency Preparedness Program at Ames Research Center, Langley Research Center, and Glenn Research Center, including all Component Facilities. (Requirement 31729)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.14.e	31730	Aeronautics research Mission Directorate shall perform the following: Respond, through the Agency emergency management structure, to requests from DHS/FEMA. (Requirement 31730)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.14.f	31731	Aeronautics research Mission Directorate shall perform the following: Support the NASA Emergency Preparedness Program with resources (reconnaissance and research). (Requirement 31731)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.14.g	31732	Aeronautics research Mission Directorate shall perform the following: Identify, for the Office of Security and Program Protection, all NSEP assets and response capabilities. (Requirement 31732)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.14.h	31733	Aeronautics research Mission Directorate shall perform the following: Appoint an emergency preparedness person to serve as a liaison to the Office of Security and Program Protection EOC as dictated by the scope of emergency. (Requirement 31733)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.a	31734	The Science Mission Directorate shall perform the following: Support emergency planning efforts, including preservation of mission essential resources. (Requirement 31734)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.b	31735	The Science Mission Directorate shall perform the following: Establish minimum levels for the effective operation of sensitive NASA systems during emergency operations or contingencies. (Requirement 31735)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.c	31736	The Science Mission Directorate shall perform the following: Provide support to each NASA Center in performing emergency preparedness. (Requirement 31736)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.d	31737	The Science Mission Directorate shall perform the following: Provide to the Office of Security and Program Protection an annual status report on the resources available to support the NASA Emergency Preparedness Program. (Requirement 31737)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.e	31738	The Science Mission Directorate shall perform the following: Provide resources for the Emergency Preparedness Program at Ames Research Center, Goddard Space Flight Center, and JPL and Component Facilities. (Requirement 31738)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.f	31739	The Science Mission Directorate shall perform the following: Respond, through the Agency emergency management structure, to requests from DHS/FEMA. (Requirement 31739)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.g	31740	The Science Mission Directorate shall perform the following: Serve as the focal point for all Science Mission Directorate programs responsible for consolidating and coordinating technical reconnaissance requests. (Requirement 31740)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.h	31741	The Science Mission Directorate shall perform the following: Advise the Office of Security and Program Protection and update annually the technical reconnaissance resources available to support the Emergency Preparedness Program. (Requirement 31741)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.i	31742	The Science Mission Directorate shall perform the following: Identify for the Office of Security and Program Protection all NSEP assets and response capabilities. (Requirement 31742)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.j	31743	The Science Mission Directorate shall perform the following: Appoint an emergency preparedness person to serve as a liaison to the Office of Security and Program Protection EOC as dictated by the magnitude of emergency. (Requirement 31743)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.15.k	34526	Upon activation of the Office of Security and Program Protection EOC, apply available Earth observing assets to provide technical reconnaissance to NASA Centers in Need of Damage Assessment. (Requirement 90000)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.a	31744	The Chief Health and Medical Officer shall perform the following: Provide support to Centers in emergency preparation matters. (Requirement 31744)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.b	31745	The Chief Health and Medical Officer shall perform the following: Respond to requests from the Agency emergency management structure in support of the NASA Emergency Response Program. (Requirement 31745)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.c	31746	The Chief Health and Medical Officer shall perform the following: Participate as a member of the Headquarters EOC as warranted. (Requirement 31746)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.d	31747	The Chief Health and Medical Officer shall perform the following: Provide support as needed to the CDRG in emergency conditions and exercises. (Requirement 31747)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.e	31748	The Chief Health and Medical Officer shall perform the following: Provide training as needed in medical and environmental health topics pertinent to emergency response. (Requirement 31748)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.f	31749	The Chief Health and Medical Officer shall perform the following: Review investigative reports and lessons learned relative to emergencies with medical/health implications. (Requirement 31749)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.g	31750	The Chief Health and Medical Officer shall perform the following: Respond to DHS/FEMA requests for support via the NASA emergency management structure. (Requirement 31750)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.h	31751	The Chief Health and Medical Officer shall perform the following: Provide medical response, follow-up surveillance, and support to recognize, evaluate, and control potential health hazards. (Requirement 31751)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.i	31752	The Chief Health and Medical Officer shall perform the following: Coordinate emergency support using NASA telemedicine, informatics, and other appropriate technological capabilities. (Requirement 31752)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.j	31753	The Chief Health and Medical Officer shall perform the following: Provide emergency response-related support through occupational health programs. (Requirement 31753)	S	I	I	Safety	CxP 70059	2.5	SAF-1045



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NPR 8715.2	6.1.16.j.1)	31754	The Chief Health and Medical Officer: Provide emergency response-related support through occupational health programs. This includes the following: Hazard communication; (Requirement 31754)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.j.2)	31755	The Chief Health and Medical Officer shall perform the following: Provide emergency response-related support through occupational health programs. This includes the following: Respiratory protection; (Requirement 31755)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.j.3)	31756	The Chief Health and Medical Officer shall perform the following: Provide emergency response-related support through occupational health programs. This includes the following: Provision of toxicological and medical information; (Requirement 31756)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.j.4)	31757	The Chief Health and Medical Officer shall perform the following: Provide emergency response-related support through occupational health programs. This includes the following: Material Safety Data Sheets (MSDS); (Requirement 31757)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.j.5)	31758	The Chief Health and Medical Officer shall perform the following: Provide emergency response-related support through occupational health programs. This includes the following: Medical response/follow-up surveillance of exposed personnel; (Requirement 31758)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.j.6)	31759	The Chief Health and Medical Officer shall perform the following: Provide emergency response-related support through occupational health programs. This includes the following: Recognition, evaluation, and control of potential health hazards; (Requirement 31759)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.j.7)	31760	The Chief Health and Medical Officer shall perform the following: Provide emergency response-related support through occupational health programs. This includes the following: Provision of training in pertinent topics (respiratory protection, lead mitigation, ventilation, bloodborne pathogens, emergency medical care, indoor air quality, etc.); (Requirement 31760)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.j.8)	31761	The Chief Health and Medical Officer shall perform the following: Provide emergency response-related support through occupational health programs. This includes the following: Distribution of alerts regarding disasters and preventive/remedial measures; (Requirement 31761)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.16.j.9)	31762	The Chief Health and Medical Officer shall perform the following: Provide emergency response-related support through occupational health programs. This includes the following: Critical incident stress syndrome and other emotional/mental health training and counseling for disaster workers and victims as required. (Requirement 31762)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.17.a	31763	Office of Earth Science shall perform the following: Support the NASA Emergency Preparedness Program and the NRP by responding to specific tasks from DHS/FEMA through the NASA emergency management structure. (Requirement 31763)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.17.b	31764	Office of Earth Science shall perform the following: Appoint an emergency preparedness representative to serve as a liaison to the Office of Safety and Mission Assurance EOC as dictated by the magnitude of emergency. (Requirement 31764)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.17.c	31765	Office of Earth Science shall perform the following: Provide resources for the Emergency Preparedness Program at Office of Earth Science Centers. (Requirement 31765)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.1.17.d	31766	Office of Earth Science shall perform the following: Upon activation of the Office of Safety and Mission Assurance EOC, apply available earth observing assets to provide technical reconnaissance to NASA Centers in need of damage assessment. (Requirement 31766)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.1.a(1)	31767	Center Directors or designees shall perform the following: Manage the program to - Ensure that all applicable individuals are properly trained to meet Federal regulatory requirements related to the emergency preparedness authorities and directives listed in Appendix A and subsequent Presidential Executive Orders or Directives. (Requirement 31767)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.1.a(2)	31768	Center Directors or designees shall perform the following: Manage the program to - Centers may use on-line systems for training and documenting training but not for the actual plan or checklists unless the systems are protected by firewalls. Plans and checklists are to be considered "For Official Use Only" and not placed on open systems. (Requirement 31768)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.1.b	31769	Center Directors or designees shall perform the following: Manage the program to - Ensure the program is visible within the organization. (Requirement 31769)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.1.c	31770	Center Directors or designees shall perform the following: Manage the program to - Provide a single point of contact for emergency preparedness to develop and coordinate the Center Emergency Preparedness Program Plan and conduct exercises. (Requirement 31770)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.1.d	31771	Center Directors or designees shall perform the following: Manage the program to - Establish an EOC and an alternate EOC. (Requirement 31771)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.1.e	31772	Center Directors or designees shall perform the following: Manage the program to - Establish a Center Emergency Preparedness Program Planning Group to assist in Center emergency preparedness program planning and in developing EOC operational procedures. (Requirement 31772)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.1.f	31773	Center Directors or designees shall perform the following: Manage the program to - Ensure that an emergency response capability exists. (Requirement 31773)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.1.g	31774	Center Directors or designees shall perform the following: Manage the program to - Ensure the Center Emergency Preparedness Program Plan addresses required reporting of hazardous material releases to regulating authorities. (Requirement 31774)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.2.a	31776	Center Directors or designees shall perform the following: Provide program planning and response capability to - Establish separate checklists and plans to cope with each known contingency. (Requirement 31776)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.2.b	31777	Center Directors or designees shall perform the following: Provide program planning and response capability to - Establish checklists and plans to support emergency response activities. (Requirement 31777)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.2.c	31778	Center Directors or designees shall perform the following: Provide program planning and response capability to - Identify parameters and levels for emergency response contingencies. (Requirement 31778)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.2	6.2.2.d	31779	Center Directors or designees shall perform the following: Provide program planning and response capability to - Establish and maintain environmental contact lists for various types of hazardous materials and waste spills. (Requirement 31779)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.2.e	31780	Center Directors or designees shall perform the following: Provide program planning and response capability to - Establish and maintain resource lists including local data and telecommunications networks. (Requirement 31780)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.2.f	31781	Center Directors or designees shall perform the following: Provide program planning and response capability to - Assess potential hazardous materials exposures and potential health effects of facility operations that have a potential for a significant emergency situation. (Requirement 31781)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.2.g	31782	Center Directors or designees shall perform the following: Provide program planning and response capability to - Correct/abate controllable threats/hazards that could result in an emergency situation. (Requirement 31782)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.3.a	31783	Center Directors or designees shall perform the following: Conduct program reviews to - Ensure all offices are involved in Center emergency preparedness program development. (Requirement 31783)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.3.a.(1)	31784	Center Directors or designees shall perform the following: Conduct program reviews to - Ensure all offices are involved in Center emergency preparedness program development: It is the responsibility of NASA Centers to ensure the operability of critical telecommunications and/or information system assets under emergency conditions, including the provision of backup power generation and other utility services; (Requirement 31784)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.3.a.(2)	31785	Center Directors or designees shall perform the following: Conduct program reviews to - Ensure all offices are involved in Center emergency preparedness program development: NASA Headquarters Mission Directorates/Headquarters Center Executives will verify the adequacy of alternative Center Utility Plan(s). (Requirement 31785)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.3.b	31786	Center Directors or designees shall perform the following: Conduct program reviews to - Ensure local hazards/threat analyses specific to the Center are reviewed annually and updated as appropriate. (Requirement 31786)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.3.c	31787	Center Directors or designees shall perform the following: Conduct program reviews to - Ensure annual reviews of emergency preparedness and emergency response procedures are current and provide copies to the Office of Security and Program Protection. The format for this report is provided annually by the Office of Security and Program Protection. (Requirement 31787)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.3.d	31788	Center Directors or designees shall perform the following: Conduct program reviews to - Provide annual Center emergency preparedness program status reports to the Office of Security and Program Protection. (Requirement 31788)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.3.e	31789	Center Directors or designees shall perform the following: Conduct program reviews to - Ensure all elements of the Center emergency preparedness program (personnel, facilities, equipment, response teams, etc.) are capable of performing assigned tasks. (Requirement 31789)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.4.a	31790	Center Directors or designees shall perform the following: Oversee the emergency preparedness program budget to - Define budget requirements for Center programs. (Requirement 31790)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.4.b	31791	Center Directors or designees shall perform the following: Oversee the emergency preparedness program budget to - Ensure that appropriate resources, personnel, and funding are sufficient for the Center emergency preparedness program. (Requirement 31791)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.5	23047	Center Directors or designees shall perform the following: Monitor the emergency preparedness training. (Requirement 23047) This includes the following:	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.5.a	31792	Center Directors or designees shall perform the following: Monitor the emergency preparedness training. This includes the following: Provide funding to conduct ongoing training for all personnel involved in the Center emergency preparedness program. (Requirement 31792)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.5.b	31793	Center Directors or designees shall perform the following: Monitor the emergency preparedness training. This includes the following: Identify training requirements and develop a training plan to support contingencies. (Requirement 31793)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.5.c(1)	31794	Center Directors or designees shall perform the following: Monitor the emergency preparedness training. This includes the following: Identify and train essential personnel and response teams. (Requirement 31794)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.5.c(2)	31795	Center Directors or designees shall perform the following: Monitor the emergency preparedness training. This includes the following: Keep a list of essential personnel as a vital record. (Requirement 31795)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.5.d	31796	Center Directors or designees shall perform the following: Monitor the emergency preparedness training. This includes the following: Establish an exercise design/evaluation group and conduct exercise and post-exercise critiques. (Requirement 31796)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.5.e	31797	Center Directors or designees shall perform the following: Monitor the emergency preparedness training. This includes the following: Conduct and document drills and exercises. (Requirement 31797)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.5.f	31798	Center Directors or designees shall perform the following: Monitor the emergency preparedness training. This includes the following: Participate in practice drills with local governments and agencies on an as-requested basis. (Requirement 31798)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.6.a	31799	Center Directors or designees shall perform the following: Review emergency response capability. This includes the following: Adopt and implement the Incident Command System at the Center. (Requirement 31799)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.6.b	31800	Center Directors or designees shall perform the following: Review emergency response capability. This includes the following: Provide public address and emergency warning systems/alerts per 29 CFR 1910.165. (Requirement 31800)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.6.c	31801	Center Directors or designees shall perform the following: Review emergency response capability. This includes the following: Ensure an effective communications capability exists in the EOC. (Requirement 31801)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.6.d	31802	Center Directors or designees shall perform the following: Review emergency response capability. This includes the following: Respond to medical emergencies and provide medical surveillance. (Requirement 31802)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.2	6.2.6.e	31803	Center Directors or designees shall perform the following: Review emergency response capability. This includes the following: Develop and maintain 24-hour communications capability: (1) During Normal Work Hours - 0730 - 1630 (Eastern Time) , Centers will notify the Office of Security and Program Protection; (2) During Other Than Normal Work Hours - 1630 - 0730 (Eastern Time) , all day weekends and holidays, calls are to be made to the NASA Headquarters Security Console at phone: 202-358-0541 (nonemergency) , 1-866-230-NASA (1-866-230-6272) (emergency) , or fax: 202-358-3382. (Requirement 31803)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.6.f	31804	Center Directors or designees shall perform the following: Review emergency response capability. This includes the following: Secure vital and classified records in accordance with the appropriate NASA policies. (Requirement 31804)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.6.g	31805	Center Directors or designees shall perform the following: Review emergency response capability. This includes the following: Provide organization chart and current rosters of essential points of contact to the Office of Security and Program Protection. (Requirement 31805)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.7.a	31806	Center Directors or designees shall perform the following: Perform damage assessment and recovery. This includes the following: Coordinate development of contingency/recovery plans for critical services and missions. (Requirement 31806)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.7.b	31807	Center Directors or designees shall perform the following: Perform damage assessment and recovery. This includes the following: Establish criteria for reporting damage assessments and forward assessment to the Office of Security and Program Protection, the Office of Infrastructure, Management, and Headquarters Operations, and appropriate Mission Directorate and Mission Support Assistant/Associate Administrators. (Requirement 31807)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.7.c	31808	Center Directors or designees shall perform the following: Perform damage assessment and recovery. This includes the following: Establish criteria for obtaining the resources necessary to recover from an emergency situation. (Requirement 31808)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.7.d	31809	Center Directors or designees shall perform the following: Perform damage assessment and recovery. This includes the following: Develop and implement mutual aid procedures with DoD, local, State, and Federal agencies and the appropriate emergency response authorities. (Requirement 31809)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.7.e	31810	Center Directors or designees shall perform the following: Perform damage assessment and recovery. This includes the following: Prioritize post event damage assessment and immediate facility dispositions (i.e. restore, shutdown or vacate, or ignore) (Requirement 31810).	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.7.f	31811	Center Directors or designees shall perform the following: Perform damage assessment and recovery. This includes the following: Establish a damage assessment team. (Requirement 31811)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.7.g	31812	Center Directors or designees shall perform the following: Perform damage assessment and recovery. This includes the following: Provide preincident preparations and post incident critiques and after-actions reports. (Requirement 31812)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	6.2.7.h	31813	Center Directors or designees shall perform the following: Perform damage assessment and recovery. This includes the following: Comply with OMB requirements for reports and accounting. (Requirement 31813) See OMB Circular A-12.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.2	7	23050	Center Emergency Preparedness Program Plans: The following standardized functional annexes shall be included in NASA Center Emergency Preparedness Program Plans: (Requirement 23050) a.) Annex A - Direction and Control; (b.) Annex B - Communications; (c.) Annex C - Warning/Alerting; (d.) Annex D - Emergency Public Affairs; (e.) Annex E - Evacuation; (f.) Annex F - Reception and Care; (g.) Annex G - Sheltering; (h.) Annex H - Health and Medical; (i.) Annex I - Security; (j.) Annex J - Facilities; (k.) Annex K - Fire and Rescue; (l.) Annex L - Radiological Defense; (m.) Annex M - Human Services; (n.) Annex N - Transportation; (o.) Annex O - Damage Assessment; (p.) Annex P - Search and Rescue; (q.) Annex Q - Hazardous Materials Response; (r.) Annex R - Emergency Operations Center; (s.) Annex S - Utilities Control; (t.) Annex T - MOU's, MOA's, and Joint Operating Procedures; (u.) Annex U - National Security Emergency Preparedness Plan. (This annex is applicable to all NASA Facilities when activated by the NASA Administrator or designee.) Each NASA Center will expand requirements of the NASA National Security Emergency Prep	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.3C	01.02.1.k	45577	Institutional and Programmatic Safety Requirements: NASA General Safety Program Roles and Responsibilities: Ensure that research and development for new or unique safety functions and technologies are conducted to help meet NASA goals. (Requirement 45577)	S	I	I	Mgmt			
NPR 8715.3C	01.07.2.1.a	45699	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: Design safety critical systems such that the critical operation or its necessary functions can be assured. To provide assurance, design the component, subsystem, or system so it is capable of being tested, inspected, and maintained. (Requirement 45699)	S	I	I	Safety			
NPR 8715.3C	01.07.2.1.b(1)	45700	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: Where high reliability cannot be verified by reliability analysis using accepted data in which uncertainties are incorporated, design safety critical systems so that no combination of two failures and/or operator errors (fail-safe, fail-safe as a minimum) will result in loss of life. (Requirement 45700)	S	I	I	Safety			
NPR 8715.3C	01.07.2.1.c	45702	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: When requesting a variance from the two-failure tolerance requirement, provide evidence and rationale that one or more of the following are met: (Requirement 45702)	U	I	I	Mgmt			

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NPR 8715.3C	01.07.2.1.c.1	45703	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: When requesting a variance from the two-failure tolerance requirement, provide evidence and rationale that one or more of the following are met: (1) Two-failure tolerance is not feasible for technical reasons. (Requirement 45703)	S	I	I	Safety			
NPR 8715.3C	01.07.2.1.c.2	45704	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: When requesting a variance from the two-failure tolerance requirement, provide evidence and rationale that one or more of the following are met: The System or subsystem is designed and certified in accordance with approved consensus standards. (Requirement 45704)	S	I	I	Safety			
NPR 8715.3C	01.07.2.1.d	45706	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: Where high reliability cannot be verified by reliability analysis using accepted data in which uncertainties are incorporated, design safety critical operations so that no single failure or operator error (fail-safe) will result in system loss/damage or personal injury. (Requirement 45706)	S	I	I	Safety			
NPR 8715.3C	01.07.2.1.e	45707	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: Where high reliability cannot be verified by reliability analysis using accepted data in which uncertainties are incorporated, provide functional redundancy where there is insufficient time for recovery or system restoration. Where there is sufficient time between a failure and the manifestation of its effect, design for restoration of safe operation using spares, procedures, or maintenance provides an alternative means of achieving failure tolerance. (Requirement 45707)	S	I	I	Safety			
NPR 8715.3C	01.07.2.1.f	45708	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: Design safety critical systems and operations to have a safety margin. (Requirement 45708)	S	I	I	Safety			
NPR 8715.3C	01.07.2.1.g	45709	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: When using redundancy, verify that common cause failures (e.g., contamination, close proximity) do not invalidate the assumption of failure independence. (Requirement 45709)	S	I	I	Safety			
NPR 8715.3C	01.07.2.1.h	45710	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: When using redundancy in operations that could cause or lead to severe injury, major damage, or mission failure (safety critical operations), verify operability under conditions, that singularly or separately added together represent the operating intended condition. (Requirement 45710)	S	I	I	Safety			
NPR 8715.3C	01.07.2.1.i	45711	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure operability and functionality and to achieve failure tolerance, project managers shall: When using reliability analyses, assess the probability of failure to provide the function and the time to restore the function, where loss of life, serious injury or catastrophic system loss can occur. Uncertainties shall be incorporated in these assessments. The time to restore the function shall include the active time to repair and the time associated with the logistics or administrative downtime that affect the ease or rapidity of achieving full restoration of the failed function. (Requirement 45711)	S	I	I	Safety			
NPR 8715.3C	01.07.2.2.a	45713	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure functional protection, project managers shall ensure that: Loss of functional protection for safety-critical operations requires termination of the operations at the first stable configuration. (Requirement 45713)	S	I	I	Safety			
NPR 8715.3C	01.07.2.2.b	45714	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure functional protection, project managers shall ensure that: At least one single level of functional protection is used to protect high-value facilities and flight systems. (Requirement 45714)	U	I	I	Mgmt			
NPR 8715.3C	01.07.2.2.c	57236	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Reliability and Failure Tolerance: To assure functional protection, project managers shall ensure that: In addition to the requirement in paragraph 1.7.2.1.b, for systems intended to be operated by humans, crew survival capabilities such as abort, escape, emergency egress, emergency medical, emergency systems, safe haven, and rescue are valid means of preventing loss of life and, when used, shall include validation, training, and certification (Requirement 57236). Note Definitions for the crew survival and associated capabilities can be found in NPR 8705.2, Human-Rating Requirements for Space Systems, and other NPRs. (Requirement 57236)	S	I	I	Safety			
NPR 8715.3C	01.07.3.1.a	45718	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Inhibits: Where high reliability is not verified by reliability analysis using accepted data with uncertainties incorporated, the project manager shall ensure that: Operations that require the control of a condition, event, signal, process, or item for which proper recognition, performance, or tolerance is essential to safe system operation, use, or function are designed such that an inadvertent or unauthorized event cannot occur (inhibit). (Requirement 45718)	S	I	I	Mgmt			

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NPR 8715.3C	01.07.3.1.b	45719	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Inhibits: Where high reliability is not verified by reliability analysis using accepted data with uncertainties incorporated, the project manager shall ensure that: Operations have three inhibits where loss of life can occur. (Requirement 45719)	S	I	I	Mgmt			
NPR 8715.3C	01.07.3.1.c	45720	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Inhibits: Where high reliability is not verified by reliability analysis using accepted data with uncertainties incorporated, the project manager shall ensure that: Operations have two inhibits where personal injury, illness, mission loss, or system loss or damage can occur. (Requirement 45720)	S	I	I	Mgmt			
NPR 8715.3C	01.07.3.1.d(1)	45721	Institutional and Programmatic Safety Requirements: Technical Safety Requirements for NASA-Unique Designs and Operations: Inhibits: Where high reliability is not verified by reliability analysis using accepted data with uncertainties incorporated, the project manager shall ensure that: The capability of inhibits or control procedures when required in operations by this paragraph are verified under operational conditions including the verification of independence among multiple inhibits. (Requirement 45721)	S	I	I	Mgmt			
NPR 8715.3C	02.2.1	45818	System Safety: Institutional Roles and Responsibilities: Mission Directorate Associated Administrators, Center Directors, program and project managers, and line managers shall ensure that system safety activities are conducted for all programs and projects including system acquisitions, in-house developments (research and technology), design, construction, fabrication and manufacture, experimentation and test, packaging and transportation, storage, checkout, launch, flight, reentry, retrieval and disassembly, maintenance and refurbishment, modification, and disposal. (Requirement 45818)	S	I	I	Mgmt	CxP 70059	2.5	SAF-1045
NPR 8715.3C	03.02.3	45993	Operational Safety: Motor Vehicle Safety: Seat Belts: Executive Order 13043, Increasing Seat Belt Use in the United States, dated April 16, 1997, as amended, requires all Federal employees to use seat belts while on official business. The EO states seat belt use is required by Federal employees operating or in any vehicle with seat belts while on Federal Business. (Requirement 45993)	S	I	I	Safety			
NPR 8715.3C	03.10.1	46107	Operational Safety: Lifting Safety: Center Directors and project managers shall comply with NASA-STD-8719.9, Standard for Lifting Devices and Equipment, for protecting persons and property during lifting operations. (Requirement 46107) Note: This standard established minimum safety requirements for the design, testing, inspection, personnel certification, maintenance, and use of overhead and gantry cranes, mobile cranes, derricks, hoists, special hoist-supported personnel lifting devices, hydrasets, hooks, mobile aerial platforms, power industrial trucks, jacks, and slings for NASA-owned and NASA contractor-supplied equipment used in support of NASA operations at NASA Centers.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.3C	03.11.1	46109	Operational Safety: Explosive, Propellant, and Pyrotechnic Safety: Center Directors and project managers shall use NSS 1740.12, Safety Standard for Explosives, Propellants, and Pyrotechnics, for protecting personnel and property from hazards of explosives and explosive materials, including all types of explosives, propellants (liquid and solid), oxidizers, and pyrotechnics. (Requirement 46109) Note: ASTM Manual 36, Safe Use of Oxygen and Oxygen Systems, addresses the requirements for working with explosive, propellant, and pyrotechnic substances.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.3C	03.11.2	46110	Operational Safety: Explosive, Propellant, and Pyrotechnic Safety: Center Directors and project managers shall ensure that explosive, propellant, and pyrotechnic operations are conducted in a manner that exposes the minimum number of people to the smallest quantity of explosives for the shortest period consistent with the operation being conducted. (Requirement 46110)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.3C	03.12.2	46130	Operational Safety: Underwater Operations Safety: Center Directors and project managers shall use NSS/WS 1740.10, NASA Safety Standard for Underwater Facility and Non-Open Water Operations, as the minimum standard to establish the safety requirements for all NASA neutral buoyancy facilities, equipment, personnel, and operations involving underwater activities including the simulation of a weightless environment. (Requirement 46130) Note: This standard also applies to NASA personnel participating in underwater operations at non-NASA facilities.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.3C	03.15.4.c	46234	Operational Safety: Non-Ionizing Radiation: Center Directors and project managers shall ensure that: Laser operations during any open-air laser scenario conducted on DoD-controlled ranges or test facilities or by DoD personnel use the Range Commanders Council Document 316-91, Laser Range Safety. (Requirement 46234)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.3C	03.15.4.g	46238	Operational Safety: Non-Ionizing Radiation: Center Directors and project managers shall ensure that: Any laser that can cause injury or damage has a Center-approved safety documentation, test plan, and test procedure review. (Requirement 46238)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.3C	03.17.5	46280	Operational Safety: Confined Spaces: Supervisor shall have the overall responsibility for entry and work in confined spaces and ensure compliance with ANSI Z117.1, Safety Requirements for Confined Space, and the NIOSH Publication No. 87-113, A Guide to Safety in Confined Space. (Requirement 46280) Note: Permit requirements for confined spaces are given in 29 CFR 1910.146, Permit-Required Confined Spaces.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.3C	09.2.1	46666	Safety and Risk Management for NASA Contracts: Applicability and Scope: When NASA activities include contractor involvement, Center Directors and project managers shall include contractors in the NASA Safety Program. (Requirement 46666)	S	I	I	Safety	CxP 70059	2.5	SAF-1045
NPR 8715.3C	09.2.2	46667	Safety and Risk Management for NASA Contracts: Applicability and Scope: Center SMA Directors, project managers, COs, and COTRs shall ensure that NASA contracts are written to hold contractors accountable for the safety of their employees, their services, their products, and for complying with NASA and Center safety requirements. (Requirement 46667)	S	I	I	Safety	CxP 70059	2.5	SAF-1045

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NPR 8715.3C	09.5.1	46707	Safety and Risk Management for NASA Contracts: Access to NASA Facilities by State and Federal Compliance Safety and Health Officers: Unless exclusive Federal jurisdiction is claimed by Federal OSHA, Center Directors and project managers shall allow both Federal and State OSHA compliance safety and health officers and investigators to review and survey contractor operations and investigate contractor mishaps at NASA Centers. Note: If the state does not have a Department of Labor-approved safety plan or the Center is under exclusive Federal jurisdiction, only Federal compliance officers shall have the right of access to NASA or contractor operations. Further access requirements for OSHA and National Institute of Occupational Safety and Health are provided in NPR 8715.1, NASA Occupational Safety and Health Programs.	S	I	I	Safety			
NPR 8715.3C	09.5.2.a	46709	Safety and Risk Management for NASA Contracts: Access to NASA Facilities by State and Federal Compliance Safety and Health Officers: Center Directors and project managers shall: Notify the OSMA, the OCHMO, Occupational Health Division, and the Designated Agency Safety and Health Official (DASHO) of any OSHA (Federal or State) impending investigations. (Requirement 46709)	S	I	I	Mgmt			
NPR 8715.3C	09.5.2.b	46710	Safety and Risk Management for NASA Contracts: Access to NASA Facilities by State and Federal Compliance Safety and Health Officers: Center Directors and project managers shall: Provide the results of Federal and State OSHA investigations to the OSMA, Safety Assurance and Requirements Division, the OCHMO, and the DASHO. (Requirement 46710)	S	I	I	Mgmt			
NPR 8715.3C	09.6.1	46712	Safety and Risk Management for NASA Contracts: Contractor Citations: Center Directors and project managers shall ensure contractor organizations are accountable for providing their employees with safe working conditions regardless of where the employees are working. Note: This provision is required by 5 U.S.C. Section 7902; 29 U.S.C. Section 651 et seq.; 49 U.S.C. Section 1421, the Occupational Safety and Health Act of 1970, as amended, and therefore, it is the contractor's responsibility to submit a timely reply to any OSHA citation it receives. The contractor is responsible for settling citations issued against its operation unless specifically addressed in the contract. (Requirement 46712)	S	I	I	Mgmt			
NSS-1740.12	0	57093	NASA Safety Standard 1740.12 is represented by this single entry. If this entry is being viewed from a filter, list, or traceability report, then the metadata applies to the document as a whole.	S	I	I	Safety	CxP 70059	2.5	SAF-1045
Opinion/impl'n Key: Y = Yes, N = NO, U = Unassigned, F = Future, C = Conditional, O = Other, D = Program Disagrees, I = Institutional, X = Not SMA Requirement, R = Resolve, P = Partial Implementation, V = Variance Approved										
Tech Auth Key: S = SMA, E = Engineering, A = Administrator, H = Health, I = Information, P = Planet Protection, F = Facility Admin, U = Unassigned										